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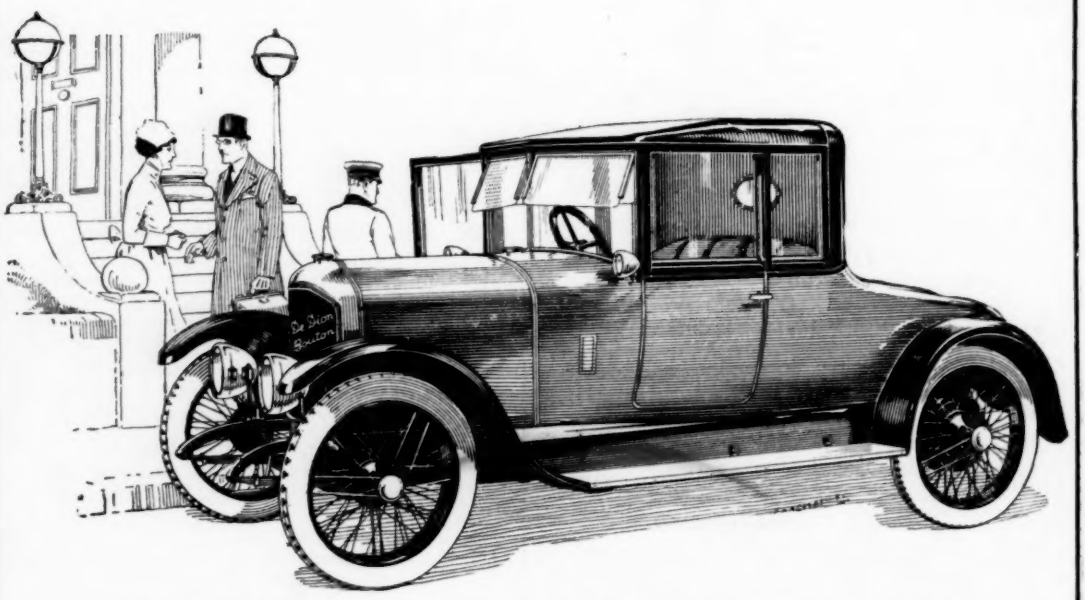

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CONTENTS.

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

AN ADDRESS on Modern Methods of Diagnosis and Treatment of Syphilis of the Nervous System. By Sir FREDERICK W. MOTT, K.B.E., M.D. 1

AN ADDRESS on the Treatment of Syphilis, with Special Relation to its Later Manifestations. By L. W. HARRISON, D.S.O., M.B. 4

ORIGINAL ARTICLES.

Tuberculous Affections of the Tongue. By R. M. HANDFIELD-JONES, M.S., F.R.C.S.—(*Illustrated*) .. 8

Forms of Tuberculous Arthritis and Their Treatment. By E. WARD, M.D., F.R.C.S.—(*Illustrated*) .. 11

Thoracic Surgery: War Lessons in Civil Practice. By R. P. ROWLANDS, M.S., F.R.C.S.—(*Illustrated*) 16

On the Identity of the Toxins Produced by Serologically Different Strains of *Bacillus diphtheriæ*. By PERCIVAL HARTLEY, *M.C.*, D.Sc. 17

von Wagner's New Treatment of General Paralysis. By Prof. ALEXANDER PILCZ 19

The Bacteriology of Ozæna. By Dr. KOZO SAKAGAMI.. 19

A Case of Primary Carcinoma of the Lung. By HENRY J. C. GIBSON, M.D., and G. MARSHALL FINDLAY, M.D..... 21

The Breakdowns of Middle Life. By R. FORTESCUE FOX, M.D., M.R.C.P..... 55

CLINICAL AND LABORATORY NOTES.

Diabetes Mellitus in an Infant Aged Five Months. By HUGH T. ASHBY, M.D., M.R.C.P. 22

A Case of Endothelioma of the Male Breast Following an Injury. By H. K. GRIFFITH, F.R.C.S. 22

A Note on Barium in the Harrogate Waters. By A. WOODMANSEY, M.Sc.. 22

Two Cases of Congenital Hemihypertrophy. By DONALD PATERSON, M.B., M.R.C.P., and F. NEON REYNOLDS, M.R.C.S. ... 23

MEDICAL SOCIETIES.

Oxford Medical Society: Treatment of Empyema. 24

North of England Obstetrical and Gynæcological Society: Heart Disease in Pregnancy..... 24

Midland Medical Society... 25

Devon and Exeter Medico-Chirurgical Society..... 25

REVIEWS AND NOTICES OF BOOKS.

The Worst Journey in the World. By Apsley Cherry-Garrard 26

Modern Methods in the Diagnosis and Treatment of Glycosuria and Diabetes. By Prof. Hugh Maclean, M.D. 26

X Rays and Radium in the Treatment of Diseases of the Skin. By George M. MacKee, M.D..... 27

L'Infection bacillaire et la tuberculose. By A. Calmette 27

Manual of Operative Surgery. By H. J. Waring, M.B., B.S., F.R.C.S..... 28

The Life of Lord Moulton. By H. Fletcher Moulton. 28

Pathology, General and Special. By Prof. R. Tanner Hewlett, M.D.... 29

Microscopical Examination of Foods and Drugs. By Prof. Henry G. Greenish, F.I.C., F.L.S..... 29

The Thomas Vicary Lecture. By Sir Charles Ballance, K.C.M.G., M.S. 29

Studies from the Rockefeller Institute for Medical Research. Reprints. Vol. XLII. 29

REPORTS AND ANALYTICAL RECORDS.

Stabilarsan. — Allenburys Diabetic Flour.—"Almata."—Pavon 30

LEADING ARTICLES.

A CENTENNIAL YEAR..... 31

SYMPTOMATIC TREATMENT . 32

NEUROSYPHILIS AND ITS PREVENTION 32

HYGIENIC TRAVEL 33

ANNOTATIONS.

New Year Honours 34

Topical Immunisation 34

Underweight and Overweight 34

Transplantation of the Living Eyeball..... 35

Impecunious Students Abroad 35

"Gentling" and Thyroid Operations 35

Operations and the Patient's Consent 36

A Children's Benefactor ... 36

Studies in Ether Anæsthesia 36

The Infectivity of Whooping-cough 37

State Aid for Tubercle in Switzerland 37

Vaccination in Madras 37

Common Errors of Diagnosis in Acute Infectious Diseases 38

Primitive Bacteriology 38

Bismuth as an Antiluetic .. 39

Barium Salts in Mineral Water 39

MODERN TECHNIQUE IN TREATMENT.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

I.—The Medical Treatment of Gall-bladder Disease. By Sir HUMPHRY ROLLESTON, K.C.B., M.D., F.R.C.P., Emeritus Physician, St. George's Hospital, &c..... 40

SPECIAL ARTICLES.

Medical Inspection in Secondary Schools. By C. W. HUTT, M.D., D.P.H. 41

Treatment of the Blinded Soldier: A Comparison of German and British Methods 44

Roumania: Precautions Against Cholera..... 46

Medicine in U.S.A.: American Relief Work in the Near East 46

PUBLIC HEALTH SERVICES.

Reports of Medical Officers of Health: Suggestions by the Scottish Board 47

A Survey of Public Health in South Africa 48

THE SERVICES.

Royal Naval Medical Service. —Royal Army Medical Corps.—Royal Air Force. —India and the Indian Medical Service..... 48

CORRESPONDENCE.

A Centennial Year (Sir John Tweedy) 49

The Prevention of Disease . 49

The Universality of Appendicitis and Cancer (Dr. Harry Campbell)..... 50

The Bacteriology of Obscure Infections (Dr. R. P. Garrow) 50

Justifiable Fœticide (Dr. A. E. Chisholm)..... 51

The Infectiousness of Diphtheria: A Question 51

Calculating Prodigies (Mr. V. Numair) 58

OBITUARY.

John James Pringle, M.B., C.M., F.R.C.P. 51

MEDICAL NEWS.

Society of Apothecaries of London..... 52

University of St. Andrews. 52

University of Dublin, School of Physic, Trinity College 52

Jenny Lind Hospital for Children, Norwich 17

The late Dr. H. Poole Berry, O.B.E. 30

Harveian Society 53

The late Dr. E. V. Gostling 53

Royal Society of Arts..... 53

The late Sir Francis Farmer 53

International Congress of Ophthalmology (1925) .. 53

Frances Wood Memorial Prize 53

Unemployment Relief and Hospital Repairs 53

The Guild of St. Luke, Cosmas, and Damian.... 53

The late Dr. Herbert Ashley Gaitskell 53

Central Midwives Board.... 53

Pasteur Centenary Dinner.. 54

Medical Society of London. 54

Bethlem Royal Hospital... 54

New Maternity Hospital at York 54

INDEX NOTICE.

THE LANCET, Vol. II., 1922 55

NOTES, COMMENTS, AND ABSTRACTS.

"Angels on the Window-Sill" 58

Public Health in Swaziland 58

Medical Diary..... 54

Appointments..... 54

Vacancies..... 54

Births, Marriages, Deaths.. 55

Manager's Notice 55

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I have been long struck by the infrequency with which paretic or tabetic patients have suffered with marked skin lesions. In fact, there is evidence to show that if a patient has had a good florid rash he would in all probability not subsequently develop general paralysis.

There is, moreover, epidemiological evidence in support of the existence of two forms. Von Düring was sent from Germany to a province in Asia Minor to investigate venereal disease, which had become very prevalent in a population which furnished the Sultan with some of his best troops. Cases of general paralysis and locomotor ataxy were not found. Again, Colonel Lambkin reported that syphilis was very prevalent among the negroes of Central Africa, especially among the Christian negro population. He likewise observed that tabes and general paralysis were rare. It therefore seems that a recent infection of a race does not lead to these late forms. It is possible in civilised countries, as Neisser suggests, that the organism has become attenuated by the widespread use of mercury, and has therefore acquired a habit of getting into a situation safe from the effects of drugs. Instances are on record of a number of men infected by the same mistress who subsequently developed general paralysis or tabes, and also of cases of conjugal parenchymatous syphilis. I have seen a number of instances of conjugal parenchymatous syphilis. I show the photograph of a man who suffered with tabo-paralysis, and of his wife who was in the same asylum with general paralysis. This may, however, be coincidence. Probably the most striking example supporting this theory of a neurotropic form of spirochæte has been afforded by Brosius, who relates that seven glass-blowers suffered with chancre of the lip, and out of five who ten years later came under observation four suffered with either tabes or general paralysis.

Förster and Tomaschewski removed during life small portions of brain from general paralytics, and found pirochætes in an emulsion of this material. They were unable to inoculate monkeys with this material which contained living spirochætes—a fact which shows these spirochætes, although morphologically indistinguishable from those found in a condyloma, are, nevertheless, not specifically identical. The reaction of the tissues, however, to the toxins of these organisms is the same.

SPREAD OF THE SYPHILITIC VIRUS BY THE LYMPHATICS.

Syphilis spreads from the seat of primary infection along the lymphatics and excites inflammation, characterised by lymphocyte, plasma cell, and connective-tissue cell proliferation in the tissues. The tendency is to fibrosis, but, owing to arterial occlusion, necrobiosis may occur in a syphiloma. The spirochæte gains access to the central nervous system by the lymphatics in the walls of the blood-vessels going to the brain or spinal cord, and along the lymphatics of the spinal and cranial nerves. Now, these lymphatics, which lie in the walls of the vessels and nerves within the cranio-spinal cavity, form part of the general lymphatic system of the whole body. Consequently, when the generalisation of the infection of the lymphatic system occurs colonisation of the spirochæte occurs in various parts of the body; the lymphatics in the cerebro-spinal meninges may then be infected and give rise to symptoms. In quite a large number of the cases of secondary syphilis the cerebro-spinal fluid gives a positive Bordet-Wassermann reaction, together with lymphocytes and protein, showing that spirochætes or their toxins have entered the central nervous system.

If syphilitic organisms get into the sheaths of the cerebro-spinal vessels then they may have a neurotropic action, and find their way into the parenchyma; here they may remain latent for a number of years before undergoing active pullulation and symptoms of disease, but they will, nevertheless, during this latent period give rise to a Bordet-Wassermann reaction (W.R.) of the cerebro-spinal fluid which, in many cases, even prolonged treatment cannot remove. It seems probable that these cases of a fluid remaining positive after prolonged treatment are cases which subsequently (on an average ten years after the primary infection) develop tabes and general paralysis. This can be explained by the fact that the organism is no longer in the general lymphatic system, but in the closed system of the cerebro-spinal fluid which irrigates the nervous tissue. The various anti-syphilitic drugs — e.g., arsenobenzol compounds, mercury, &c.—cannot pass through the choroid plexus which secretes the cerebro-spinal fluid, and therefore they do not, when administered, come into contact with the organisms. Similarly these drugs have not proved successful in sleeping sickness, when the *Trypanosoma gambiense* is found in the cerebro-spinal fluid.

The interstitial form of the disease is very amenable to treatment because the organisms are in the general lymphatic system, and if the spirochæticidal drugs are employed before the inflammatory reaction of the tissues have caused neuronic degeneration a cure can be effected; indeed, no serious organic disease of the nervous system yields such strikingly satisfactory results as that due to syphilis—provided prompt and efficient treatment is adopted. Most practitioners have now disabused their minds of the long prevailing idea that organic disease of the nervous system is usually a tertiary phenomenon of syphilis. Fournier long ago showed that the greatest number of cases occur in the first two years and diminish with each succeeding year. I have myself seen a case with symptoms and signs of meningitis while the sore was yet unhealed.

SIMULTANEOUS OR SUCCESSIVE AFFECTION OF TISSUES IN BRAIN AND SPINAL CORD.

There are many forms of syphilitic disease of the nervous system. As a rule both the brain and spinal cord are simultaneously affected, and the disease is regarded as spinal or cerebral syphilis according to

the predominance of spinal or cerebral symptoms. This is pathologically explicable, for it depends upon the mode of extension along the lymphatics. The reason why the base of the brain is probably so frequently affected is explicable by the spread of infection along the lymphatics of the vertebral arteries. Cerebral and spinal symptoms frequently occur simultaneously. There is hardly any organic disease of the nervous system which may not be simulated by syphilitic disease, but it must be remembered that many functional diseases may occur in syphilitic subjects. Neurasthenia with syphilophobia, on account of venereal disease propaganda, is frequently met with at the present time.

CEREBRAL SYPHILIS.

Syphilis may produce an endarteritis, but not until occlusion of diseased vessels by thrombosis do obtrusive signs and symptoms occur, such as various forms of motor and sensory paralysis. Premonitory symptoms, such as headache, lapses of consciousness, and symptoms which might be considered neurasthenic occur. Endarteritis may, however, be associated with signs and symptoms of meningitis, and various forms of paralysis, especially of the eye muscles and the optic nerve, commissure or tracts may be affected and visual defects and blindness result; other cranial nerves may also suffer. Headache, worse at night, with any of the above signs and absence of pyrexia should always make one suspect syphilis as a cause. Again, gummatous tumours may occur in severe cases, and then general signs and symptoms of tumour, associated with meningeal or vascular symptoms. Solitary syphiloma may occur and give rise to all the signs and symptoms of increased intracranial pressure, and it is well to point out that its not yielding to antisyphilitic treatment does not preclude its diagnosis. The reason appears to be that in the central nervous system drugs have not the same powers of absorption as elsewhere in the body; especially is this the case when sufficient time has elapsed for the formation of a dense fibrous capsule around the gummatous mass.

SPINAL SYPHILIS.

Syphilitic meningomyelitis is the most frequent cause of paraplegia in young male adults, and root pains and dysæsthesia over the skin segments corresponding to the roots affected are the earliest warning symptoms; the superficial and deep reflexes may be affected. Now if we look at the sections of the spinal cord of a man who suffered with meningomyelitis, you will see that the inflammatory reaction has spread along the septa which carry the lymphatics and blood-vessels, and if this is allowed to proceed from delay in treatment, there will result a focal transverse myelitis. The fibres of the long tracts of the spinal cord which carry voluntary impulses from the brain to move the muscles of the lower extremities will be cut through, and a descending degeneration of the upper segment of the motor path will ensue. Regeneration of these long tracts which convey impulses from and to the brain cannot occur, and a spastic paraplegia is the result. [These pathological conditions of the nervous system were demonstrated by the lantern.]

DIAGNOSIS BY LABORATORY METHODS.

If syphilis is suspected, or even if it is not, in many cases of nervous disease a W.R. of the blood should be obtained; if this is negative, syphilis can, as a rule, be excluded as the cause. If it is positive, it does not necessarily follow that the disease is syphilitic, for a large number of people may give a positive W.R. of the blood and yet not be suffering from syphilis of the nervous system.

In numerous cases where there are nervous symptoms indicative of organic disease of the nervous system, the pathological nature of which has not been determined, lumbar puncture should be performed and the fluid examined. A positive W.R. makes it certain that the spirochæte is in the nervous system. If there is at the same time a marked protein reaction and a large number of lymphocytes and plasma cells, the case is one of active syphilis of the nervous system and requires immediate treatment. The cells and the protein may disappear, and in rare cases even the W.R. also, but in the great majority of cases, even when all symptoms have ceased, the W.R. may remain, so that the diminution and disappearance of the cell and protein reactions may serve as a useful means of determining the success of the treatment. I may remark that in general paralysis the fluid practically always gives these three reactions; it also gives a colloidal gold reaction, which it is said helps to distinguish the disease from interstitial syphilis of the nervous system. A considerable percentage of cases of tabes with obvious clinical symptoms may not give a positive W.R. of the fluid; this, however, should not be a deterrent to antisyphilitic treatment. It is possible that in these cases the toxin, but not the spirochæte, has, at one time or another, gained access to the closed system of the central nervous system.

DRUG TREATMENT OF SYPHILIS OF THE NERVOUS SYSTEM.

General Principles of Treatment.—The diagnosis of the nature of the syphilitic lesion having been made, it is necessary to decide upon the mode of treatment. It is better not to have a fixed scheme, but to be guided by general principles dependent upon the age, health, sex, and weight of the patient, together with the character and intensity of the syphilitic affection and history of previous treatment for syphilis or other diseases. I have already emphasised the importance of an examination of the cerebro-spinal fluid both in diagnosis of preclinical affections of the nervous system as well as in affording an indication of progress and success of treatment. The modern treatment by salvarsan requires a thorough clinical examination. The older a patient is, the greater should be the care in the dosage, method, and frequency of administrations. Disease of the lungs, of the heart, or the arteries, and especially of the kidneys, calls for special attention and care. It must be borne in mind that in a fair proportion of cases of disease of the nervous system a combination of diseases of these organs occurs. Arterio-sclerosis and other degenerative conditions should make one especially cautious in persons of advanced age; those whose constitutions are broken down by chronic alcoholism or disease also require great care. The urine should always be carefully examined. A trace of albumin with no casts, or with only a few hyaline casts, may exist in syphilitic patients, or the presence of albumin may indicate an idiosyncrasy. Seeing that in fatal cases following salvarsan injection the kidneys have been found to contain the most arsenic of all the organs of the body, it follows that even a trace of albumin should make one cautious in the administration of either mercury or salvarsan. The urine should be tested twice a week during treatment, and any indication of albumin present prior to treatment, and the appearance of granular casts, should be a danger-signal either to beginning or continuing arsenobenzol treatment. Probably small doses of neosalvarsan are less dangerous than mercury injections in syphilitic albuminuria.

Selection of Mode of Treatment.—In the matter of selection of mode of treatment it is very necessary to discriminate between active inflammatory processes due to active spirochætal pullulation causing a generalised gummatous meningitis or localised gummatous tumours, and necrotic softening due to thrombosis of vessels caused by a pre-existing endarteritis in which there is no evidence of active development of the specific organisms. I have in mind cases which gave a negative Bordet-Wassermann reaction, and yet by treatment were relieved of symptoms. Of course, the two conditions may occur simultaneously at all periods of time following infection, although the combined conditions on the one hand are especially liable to ensue in untreated or

inefficiently treated cases occurring in the first few years after infection; the necrotic softening, on the other hand, occurs more often in the later tertiary stages where there may be no clinical evidence of active spirochætosis. The clinical symptoms, pointing to irritation phenomena, should be recognised before any arterial thrombosis and necrotic softening occur, or, if the signs and symptoms point to necrotic softening with paralytic phenomena, we should make certain whether there is any active inflammatory process occurring simultaneously.

Before the introduction of salvarsan great success was obtained in such cases by immediate and energetic mercurial treatment, either by injections or inunctions, and it is well not to forget that mercury is still of the greatest value in treatment.

Having decided that the patient is fit for a particular course of treatment, it is necessary to decide how and by what channel the treatment is to be administered. The introduction of the arsenobenzol treatment does not imply that it is necessary to discard old and well-recognised methods of treatment such as mercurial inunction and injection, or the use of iodide of potassium. In cerebro-spinal syphilis I have seen the most satisfactory results obtained by such methods of treatment before the introduction of salvarsan. In making a choice the physician will be influenced in his decision by various circumstances—e.g., the chronicity of the symptoms, the result of examination of the blood and cerebro-spinal fluid, the advisability of consulting the patient's interests and feelings—particularly in the matter of prescribing mercurial inunctions for a married man—and also upon the likelihood of the patient carrying out satisfactorily such a mode of treatment.

Modern Intensive Mode of Treatment.—The treatment which is usually adopted for syphilis of the nervous system is as follows: A dose of 0·15 to 0·3 g. of neosalvarsan is given either intramuscularly or intravenously to test the individual's tolerance to the drug. This is repeated in a few days' time, and, provided no signs of intolerance are shown, a week later a full dose of 0·6 to 0·9 g. is given and repeated each week for from six to eight weeks. The weekly dosage may be regulated by the condition of the patient, and the evidence of tolerance or intolerance shown by the reactive phenomena. Plaut recommends an initial ten days' course of mercurial inunction, and a series of grey oil injections at three-day intervals (five injections of 0·2 to 0·5 g.). The urine should be tested for albumin each week, and other symptoms of intolerance of the drug or evidence of chronic intoxication should be carefully looked out for. An examination of the cerebro-spinal fluid and blood should be made at the end of the course of treatment, and the four reactions compared with those obtained prior to the beginning of treatment.

Some authorities are content with the employment of arsenobenzol alone; others give weekly mercurial intramuscular injections of 0·03 to 0·05 c.cm. of mercury, grey oil, or calomel cream, or a course of mercurial inunction consisting of 30 to 40 rubbings of unguentum cinereum, one drachm (4 g.) may be employed. Mercury in the form of Hutchinson's pill, 1 gr. (60 mg.) of grey powder and 1 gr. (60 mg.) of pulv. ipecac. comp. three times a day, may be used in some cases. Between the courses of treatment eight weeks are usually allowed to intervene. Iodide of potassium in 10 to 15 gr. doses or even more three times a day may be given in the interval according to tolerance of the drug, combined with ½ to 1 dr. doses of tincture of cinchona.

At the International Congress of Neurologists, held in Paris in 1920, Sicard pointed out that in certain cases grave symptoms and occasionally fatal results may arise in the course of, or consecutive to, the employment of arsenobenzol compounds. These are directly or indirectly due to its administration. They are as follows: (1) Idiosyncrasy—i.e., individual susceptibility to arsenic which may occur in a syphilitic or non-syphilitic subject directly, or some minutes after the intravenous injection, or even one or two hours after. The patient is seized with anguish, general malaise, and vasomotor disturbances, which especially affect the face. These last from some seconds to a few minutes. Sometimes the attack is accompanied by a general trembling, nausea, and rise of temperature; this is the nitritoid crisis of Milian. Another sign of predisposition to arsenical intolerance is the appearance of erythematous rashes after the first dose. (2) The neuro-recidive or Herxheimer reaction. He pointed out that mercury does not produce this reaction, and that its administration prior to the administration of salvarsan prevents the appearance of this reaction. (3) Anaphylaxis. The reactions of an anaphylactic character are often serious. They may be fatal, and they are characterised by convulsive movements, pulmonary œdema, and coma. Anaphylactic shock occasionally occurs on the next day, or the day after the second or third weekly injection.

Sicard states that in 200 to 300 cases of neural syphilis, treated exclusively by small repeated doses of neosalvarsan, he has not had a single case of anaphylactic shock. The preparations he uses are novarsenobenzol, galyl, and sulfarsenol, in doses of from 0·15 to 0·2 g. They can be used intravenously, or by dissolving in an oily medium or aqueous glucose; they can be used subcutaneously or intramuscularly. In this way he obtains a total dosage of 8 g. of the medicament. He states that only once has he noticed an abscess result, and that intramuscular injection is nearly painless. Following Sicard, I have employed intramuscular injections of novarsenobenzol in aqueous glucose in similar small repeated doses, and this treatment has been very successful and painless. This "driblet" method has also been advocated by Colonel Harrison, who states as follows: "The subcutaneous injection has the further advantage that it can be given without reference to a meal." Sicard claims that in chronic syphilitic diseases of the nervous system the results are superior to those obtained by weekly intravenous injection, and the Bordet-Wassermann reaction of the blood and cerebro-spinal fluid shows a better result by repeated small doses every two days for a period of two months than by the weekly injection. He does not believe that small doses produce an arseno-resistance, as experiments seems to indicate. Harrison states that sulfarsenol has the great merit of causing little pain when given subcutaneously or intramuscularly. He also states that he has found that silver salvarsan appears to be twice as strong as sulfarsenol, and he has found it very useful in tabes and other syphilitic diseases of the nervous system. He also relates the history of a case of general paresis. While admitting that remissions occur spontaneously in this disease, he considers that although this case is incomplete it has "proceeded far enough to show that colossal doses of silver salvarsan do affect adversely the deeply-buried spironemes."

POSSIBLE TOXIC INCIDENCE OF THE INTENSIVE CURE.

A slow progressive intoxication by the arsenic, whether given intravenously, weekly, or by repeated small doses every other day, may be manifested by the following signs: (1) Erythematous rashes are symptoms of the terminal phase of the treatment and indicate an interruption of further injections for at least eight to ten weeks; they also point to caution being exercised in further administration. Some authorities have noticed that certain tubes of novarsenobenzol have appeared to be more productive of an erythematous dermatitis than others. (2) An early indication of the toxic action of the arsenic on the peripheral nerves is the disappearance of the Achilles tendon-jerk, although there is no paresis or necessarily any subjective sensory disturbances. (3) Jaundice, which usually clears up in from three to four weeks. In pushing the treatment these signs of toxic effects should be carefully looked for.

The careful practitioner, knowing of these early complications and late intoxications, will prudently apply the knowledge of their causation to their prevention and thus avoid risks as far as possible. Harrison, in a recent valuable article on the Modern Treatment of Syphilis,[1] states: "Jaundice and dermatitis have certain features in common. Both are apt to be fatal, and both may appear long after a course of injections has been given." Considering the immense number of cases which have been treated successfully by the intensive method, we should not be deterred from using this valuable intensive mode of treatment of neurosyphilis by the fact of occasional accidents.

INTRATHECAL TREATMENT.

Injection of Serum Salvarsanised In Vivo.—In 1911, working independently, Swift and Ellis, Marinesco, Fisher, and George Robertson introduced the method of treatment of syphilis of the nervous system by intrathecal injection of serum salvarsanised in vivo. The general consensus of opinion is that spinal intrathecal injections of salvarsanised serum or hypotonic solution of neosalvarsan are still on trial, and it is not yet proved that they possess advantages over the intravenous or intramuscular methods of treatment. Another method is to give intravenous or intramuscular injections of arsenobenzol or silver salvarsan, followed by lumbar puncture and withdrawal of cerebro-spinal fluid. The intracranial injections in the treatment of general paralysis have been for the most part given up. I have made autopsies in a number of cases so treated, and have found active spirochætosis.

We have yet to learn whether salvarsan treatment will reduce the number of cases of tabes and general paralysis; there is a feeling on the part of a good many neurologists that the modern treatment by arsenobenzol compound presents no very great advantage in the treatment of neurosyphilis over that obtained by the systematic treatment by mercurial inunction and intramuscular injections of mercury combined with iodide of potassium. This, however, may be due to the fact that when the new treatment was introduced many patients thought that a few intravenous injections of salvarsan would be sufficient to complete a cure, and Harrison, from a long experience, has uttered a note of warning that "unless a patient is willing to persevere until he has received a substantial amount of the arsenical remedy, it is better to withhold the latter—this applies especially to tabes."

It is well to note that even after prolonged and intensive treatment the blood may give a positive Bordet-Wassermann reaction, but if the patient's fluid shows a positive reaction as well as the blood a constant menace remains, although the patient may exhibit no clinical symptoms. The positive reaction of the blood is not nearly of so great importance, for I have found a large number of people of all ages giving a positive reaction of the blood, and yet exhibiting no signs indicative of syphilitic disease, or at any rate of disease which would bring them to the doctor for treatment. It is well to mention this fact, for the general public are aware of the significance of this blood reaction, and I have seen many cases of syphilophobia in consequence of an exaggerated view of its importance.

[1] Brit. Med. Jour., July 1st, 1922.

THE COMPLETE WORKS OF PASTEUR.—Messrs. Masson et Cie, Paris, are issuing a complete edition of the works of Pasteur in seven volumes, of which two have already appeared. It appears that Pasteur's works have never been collected. They are at present scattered in reports to academies, in reviews, and scientific journals; only the studies on brewing and silkworm disease have been put under one cover. Dr. P. Vallery-Radot has arranged the selection, adding a number of notes and hitherto unpublished information. The two volumes which have already appeared are entitled "Dissymétrie moléculaire" and "Fermentations et générations dites spontanées."

An Address

ON THE

TREATMENT OF SYPHILIS,

WITH SPECIAL RELATION TO ITS LATER MANIFESTATIONS.

Delivered before the Harrogate Medical Society on Dec. 7th, 1922,

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MAY I first say something on the prevention of the later manifestations of syphilis? Prevention is particularly important because the best results of treatment of late syphilis leave a greater or less degree of crippling or deformity. We may put out the fire but we can do nothing towards rebuilding the house, and Nature can do little. Although only a comparatively small proportion of syphilitic subjects may suffer from late effects, these may be so tragic that we must consider their possibility in every case, and apply to that case such measures of prevention as we can command.

First I would urge a thorough initial treatment. I fear that the tendency in this country to be content with sufficient treatment to convert the blood reaction to negative and then to wait and see, or else to continue treatment only with mercury, may leave us with a high proportion of cases in which recurrence occurs in the central nervous system. In the early days of "606" we witnessed a large increase in the number of cases of early syphilis of the central nervous system, as shown by paralysis of various cranial nerves, notably the facial and auditory. Considerable research has been carried out with a view to discovering why the brunt of syphilitic recurrences following purely arsenobenzol treatment fell so often on the central nervous system; and this, as I interpret it, seems to be the explanation. The unchecked syphilitic process calls forth an immunity response on the part of the tissues. There is natural evidence of this in the long periods of latency which generally follow the secondary stage, and in the fact that the late recurrence falls so very often only on a damaged or overworked part of the body; where, in fact, the tissues have temporarily lost their supremacy over the parasites. There is, I think, experimental evidence of immunity not only in the fact that, so long as the disease exists, the patient cannot be re-inoculated, but also in the recent work of Eberson,[1] who found that if the serum of a syphilitic subject of some years' standing is mixed with syphilitic virus, and the mixture injected into a rabbit's testicle, infection does not occur, though the same virus infects when injected alone. Interference with the syphilitic process by means of agents which destroy *Spironema pallidum* stops the production of the immune substance in proportion to its effect on the virus. Brown and Pearce[2] found in animals that if an arsenobenzol compound was given which interfered with the development of the initial lesion but did not destroy the parasites completely, generalised syphilis was more certain to follow. Further, the stage in the development of the initial lesion at which the interference took place seemed to determine the sites of recurrence. Thus, after very early interference the recurrence very often occurred in bones. If the initial lesion was allowed to progress a little further, bones escaped, but skin and mucous membranes were affected, and by allowing still further development of the initial lesion, time was given for the bones, skin, and mucous membranes to soak up, if I may put it so, enough immune substance to make them resistant, but interference at that point would often leave the eyes unprotected, and recurrences occurred there. In

[1] Arch. Derm. and Syph., 1921, October, p. 490.
[2] Ibid., 1921, March, p. 254.

other words, the experiments tended to show that, as a result of a local lesion, the remaining tissues of the body gradually acquired a resistance, but that this acquisition was not even or simultaneous, bones taking the first supply of immune substance, then skin, and mucous membranes. These experiments and the other facts I have cited seem to go far towards explaining neuro-recurrences after an insufficient arsenobenzol treatment. The syphilitic process is stopped in the periphery and with it the production of immune substances; the remedy does not reach the central nervous system in sufficient concentration to kill the parasites there, and the central nervous system is left at their mercy without the help it would otherwise have derived from immune substances elaborated in the periphery. It might be argued from this that it would be better not to interfere but to leave things to Nature, relying on a sufficient production of antibody. Although, however, the natural resistance of very many patients seems to be sufficient to carry them to old age in fair, or even good, health, we know, on the other hand, that it is often insufficient and that treatment on right lines gives better results. The point to remember in considering what are right lines is that treatment stops the stimulus to antibody production and that it must be at least as penetrating, as far-reaching, and as effective as would have been the antibodies if we had allowed them to form. Otherwise our patient falls between two stools.

Incidence of Syphilis at the Present Day.

A few months ago it was suggested to me that we should soon know whether arsenobenzol treatment reduced the incidence of general paresis and tabes. I thought not, because even yet the idea is not dead that a few doses of arsenobenzol are sufficient to cure a case of syphilis, so that the arsenobenzol treatment has hardly had a chance of showing what it can do towards preventing late recurrences. In fact, for the reasons I have given, I fear that general paresis and tabes may increase for a time in consequence of the small amount of treatment administered to large numbers of patients since the introduction of salvarsan. Had these been on mercury or even left untreated the disease would have continued to simmer in the periphery and the central nervous system would have received some protection from the immune substances formed in the periphery.

At present, however, there is no sign of any increase in general paresis, judging by figures supplied by the Registrar-General, from which the following table has been constructed:—

Deaths per Annum from General Paresis, 1906 to 1921.

Average per annum, 1906 to 1918:—

		Maximum.	Minimum.
Males ..	1777	1940 in 1917	1713 in 1908
Females ..	457	568 in 1906	341 in 1918
Total ..	2234		

Proportion of females to males: 1 to 3·9.

Year.	1919.	1920.	1921.
Males	1336	1270	1254
Females	272	234	283
Totals	1608	1504	1537
Proportion of females to males	1 to 4·9	1 to 5·4	1 to 4·4

I am not able to account for the great decrease in deaths from G.P.I. from 1919 to 1921, and I have shown the figures only to combat an idea which seems to prevail in some quarters that this manifestation of syphilis is on the increase even now. I do not think the decrease is connected with treatment, since, in the case of females at any rate, the great majority of cases of syphilis infected five or more years ago must have been treated just as inadequately as was the custom 20 or 30 years previously. The present-day figures do not seem to me an index of what to expect in the future, and I still fear that those who are content with merely getting rid of peripheral symptoms by means of arsenobenzol injections may be laying up trouble in store for the future in the form of severe recurrences in the central nervous system. About 30 per cent. of our cases start treatment with pathological spinal fluid; we know that it is easier to convert the blood to negative than the fluid, and for this reason alone it seems to me that we ought to go on with treatment far beyond the stage when the blood first becomes negative. If it were practicable to do so, I would not dismiss any case from treatment unless and until the spinal fluid had been negative for some months, and, whenever it could be arranged, I would take at least one specimen of spinal fluid at the end of the 15 or 18 months of arsenobenzol and mercurial treatment, which I prescribe *as a minimum* for secondary cases. I believe that, if this were universal, we should have little to fear from late recurrences.

Importance of Positive Blood Reaction.

As another measure of prevention of late syphilitic recurrences I advocate strongly the persistent treatment of the case with a positive blood reaction, but no other signs discernible by ordinary examination. As you know, opinions differ on this point; some say that treatment is a hopeless business, as the reaction will never become permanently negative, and that in any case a positive at this stage means nothing. I hold strongly that a positive blood reaction indicates active syphilis. If it did not, I cannot understand why treatment should affect the reaction, as can be shown by carrying out a quantitative test of its strength from time to time. It is mainly out of the ranks of the positively reacting persons that we get sudden deaths from syphilitic myocarditis, tabetics, general paretics, and so forth, and if we are going to prevent these tragic consequences of syphilis we ought to keep the patient under treatment as long as he shows any signs of being uncured, even though it may be for many years. If a patient with an infection of long standing and with a positive blood reaction had negative spinal fluid, we might perhaps remit a little from the programme, but even a negative fluid is not a guarantee that the central nervous system is free; besides this, we are still left with the danger of recurrences in the cardiovascular system and the viscera. The treatment I usually prescribe for these cases of clinically latent syphilis with positive blood reaction is an initial course of seven to ten injections of "914," or similar product, totalling 4·5 to 6·3 g., with 7 to 10 gr. of mercury by injection, and this is followed by a series of courses of five to six injections of arsenobenzol and mercury at intervals lengthening from 2 to 3, 4, and 6 months as the treatment proceeds. In these cases also I think it useful to supplement the arsenobenzol and mercury with iodide, employed in short courses of two or three weeks after each course of injections.

Treatment of Some Late Manifestations of Syphilis.

May I now speak of the treatment of some late manifestations of syphilis?

Myocarditis.—In this condition I have had some most encouraging results from deep subcutaneous injections of sulfarsenol (0·3 to 0·48 g.), combined with mercury and iodide by mouth, in the form of yellow iodide of mercury. The total amount of sulfarsenol in each course is about 6·0 g. The mercurial treatment commences with three tabloids of gr. $\frac{1}{6}$ a day, and works up to eight or even 12 tabloids a day, or until signs of intolerance develop. The intervals between courses are about six weeks at first and increase to about three months. In the intervals I give some preparation containing more iodine than is present in the yellow iodide, such as potassium iodide, rhiodine, alival, or iodicin, for about three weeks prior to each course. The results can be excellent, but naturally the patient must be in the best possible circumstances to carry out the general régime appropriate to persons with enfeebled cardiac musculature.

I have in mind a case of syphilitic myocarditis sent to me by Dr. F. W. Price, which seemed at first hopeless from the point of view of restoration to work. I had to exercise great care over the dosage at first, or symptoms were aggravated, but gradually the process was brought under control after about 10 months' treatment, and the patient is now again at work as a surgeon.

Aneurysm.—Here I think the ruling circumstance as regards dosage is the possible association of myocarditis and coronary endarteritis. In such cases I treat on the same lines as myocarditis, giving small doses of arsenobenzol twice weekly. Otherwise cases of aneurysm seem able to stand quite large doses of arsenobenzol, and to one case in which there was also general paresis I repeatedly gave huge doses of silver-salvarsan (up to 1·0 g.) without ill-effect. I would always treat such cases with anti-syphilitic remedies, even though the artery cannot be restored to its normal condition, because stoppage of the active syphilitic process seems the only way which offers any hope of staying the progressive weakening of the vessel walls.

Hepatic Syphilis.—This manifestation calls for caution with arsenobenzol in view of its toxic effect on liver cells. In such cases I would recommend always to keep the patient well fed with carbohydrates, on the principle that liver cells which are full of glycogen do not take up such poisons as chloroform and arsenobenzol. The suggestion was made to me by Prof. Hugh Maclean at St. Thomas's Hospital, and its application seems to have had the effect of reducing the incidence of jaundice there very considerably.

Visceral Syphilis.—I need only detain you over visceral syphilis to remind you that more and more cases simulating gastric carcinoma, gastric ulcer, and chronic gastritis are being proved by the effects of anti-syphilitic treatment to be syphilitic in origin, and it seems rational that, in such cases, a blood examination should always be made with a view to a trial of anti-syphilitic treatment if the result should be positive. It is, of course, hardly necessary to mention that more than one tabetic patient's abdomen has been opened as a result of the belief caused by a gastric crisis that something tragic had happened to the stomach or duodenum. I have touched only lightly on the subject of visceral syphilis because I should otherwise have little time left for syphilis of the central nervous system, which may occur early or in the later stages.

Syphilis of the Supporting Structures of the Central Nervous System.—In this condition, manifested by gumma, thrombosis of cerebral and spinal blood-vessels, meningitis and meningo-myelitis, the outlook is generally good, provided that treatment commences promptly. Too often irreparable damage has been done before the case is recognised as a syphilitic recurrence, and the treatment fails to restore function completely. I have found this particularly in the case of neuro-recurrences. For example, a patient has been treated some time previously with arsenobenzol and then left; paralysis of facial and auditory nerves has followed, and the cause of the paralysis has been unrecognised, or perhaps even attributed to the arsenobenzol; the result is that treatment is not resumed, all life is crushed out of the affected nerve by the syphilitic process, and the patient is left with permanent facial paralysis and nerve-deafness on one side. I would suggest in all cases of syphilis of the supporting structures of the central nervous system a fairly low dosage at first, in bi- or even tri-weekly injections, as the internal coats of arteries are practically always thickened, and a Herxheimer reaction causing a little further thickening may stop the flow of blood through a very important vessel. After a few weeks' treatment on the lines of cautious individual dosage, one can usually proceed with doses such as are considered safe for ordinary cases. Courses of treatment should total at least 6 g. of "914" before an interval of any length is allowed. As soon as the course is finished I start giving iodide of potassium, or some organic preparation of iodine, pushing it for about three weeks. As in all other cases, I recommend strongly that treatment be prolonged in courses of injections with intervals extending gradually from six weeks to three months, until long past the stage when the blood and cerebro-spinal fluid have been rendered negative.

The correct treatment of syphilis of the parenchyma of the central nervous system has, as you know, aroused great discussion, particularly in America, where the protagonists and the opponents of the Swift-Ellis and the Ogilvie methods of intrathecal injections wage fierce battles. Both these forms of treatment depend on the principle that, since arseno-benzol introduced into the systemic circulation does not reach the parenchyma of the central nervous system, it is better to put it into the subarachnoid space, where it will mix with the cerebro-spinal fluid and so be brought into contact with *S. pallidum* buried in the parenchyma of the central nervous system. Excellent results are claimed for this form of treatment, and I have myself seen cases benefit by it who were not progressing well on the ordinary intravenous or intramuscular treatment, but, like many others, I am uncertain as to the rationale of it. At least three factors are concerned in intra-thecal therapy. The intravenous injection, the lumbar puncture, and the introduction of the salvarsanised serum. Intravenous medication usually acts well. Lumbar puncture alone has also an effect on tabes, as I have seen two cases in which the mere withdrawal of a few c.cm. of cerebro-spinal fluid resulted in recovery of power by a previously paralysed bladder. Both these factors have to be reckoned with in the usual intrathecal therapy. What about the effect of the third? Is it because the medicament introduced into the spinal canal acts more potently on the spirochætes in the parenchyma, or is it because of some non-specific action, whether it be from assisting the passage of the drug from the systemic circulation to the lymph of the central nervous system, or in some other way? It seems to me at least open to doubt whether the cerebro-spinal fluid is the lymph of the central nervous system and does therefore come into contact under natural conditions with the parenchyma. I admit that substances introduced into the cerebro-spinal fluid can be forced back to the neighbourhood of the pyramidal cells, but I feel some doubt about its occurring under natural conditions. The cells of the nervous system are highly organised, and the liberality of their blood-supply indicates a large requirement in food, while the cerebro-spinal fluid is such thin stuff that one wonders how it could possibly contain the required nourishment. Some work by J. Wynn [3] seems to indicate that even when arsenobenzol introduced into the spinal canal is brought into close contact with the brain parenchyma the results are indifferent. Thus intravenous injection of 15 per cent. salt solution results in the cerebro-spinal fluid being drained back into the systemic circulation, as shown by Weed and McKibben [4] and by Foley and Putnam,[5] and iron salts introduced into the spinal canal of animals prior to this internal drainage are found later in the vicinity of the pyramidal cells. Wynn gave 200 c.cm. of 15 per cent. saline intravenously to human beings and at the same time introduced salvarsanised serum into the spinal canal. As mentioned, the results in a number of cases were indifferent, and Wynn concluded that intraspinal injections combined with internal spinal drainage was of no therapeutic value. His experiments seem to show that intraspinal therapy is of no value unless combined with antisyphilitic treatment by the systemic route. Further, since in these cases the drug was brought into far closer contact with the parenchyma than occurs under the ordinary conditions of intraspinal treatment, it seems reasonable to suppose that the drug injected into the subarachnoid space does not act by virtue of any spirochæticidal effect.

[3] Arch. Internal Med., January, 1922.
[4] Amer. Jour. Physiol., 1919, xlviii., 512. Referred to by Wynn.
[5] Ibid., 1920, lili., 464. Referred to by Wynn.

Another form of treatment of parenchymatous nerve syphilis is that introduced by Gilpin and Earley and advocated strongly by Dercum. The principle is to assist penetration of the drug given into the systemic circulation by lowering the intrathecal pressure. The patient receives a full dose of an arsenobenzol preparation, and in the next half hour or so as much fluid as possible is drawn off by lumbar puncture, the idea being to break down the resistance of the cerebral vessels to the transudation of arsenobenzol by exerting a strong pull from the subarachnoid side. I have tried this form of treatment in some cases of G.P.I., and they have done well, but I have also given very large doses of silver-salvarsan at the same time and am not quite sure how much the drainage contributed to the result. Excellent results have, however, been claimed for the method by Hearn[6] working at the London Lock Hospital, and he employed only ordinary doses of arsenobenzol. Regarding the drainage method of treatment in tabes, my experience leads me to recommend some caution. Cases of tabes seem to be much more sensitive than others, not only to excessive individual dosage, but to excessive drainage, as I have seen them made definitely worse by both faults in treatment. I have seen cases of tabes benefit by simple lumbar puncture, removing only a few c.cm. of fluid, but that is different from the removal of 40, 50, or even 80 c.cm. of fluid, as is done in the Gilpin-Earley method. So I try an ordinary lumbar puncture first and see how the patient stands it, just as I always try very small doses of arsenobenzol, and watch pretty carefully before venturing on increases.

Another method of carrying out the Gilpin-Earley principle of spinal drainage has been suggested by Corbus, O'Conor, Lincoln, and Gardner.[7] It is based on the effect of intravenous injection of hypertonic saline which I mentioned earlier in connexion with Wynn's work. The patient receives at, say, 10 A.M. an intravenous injection of 100 c.cm. of 15 per cent. sodium chloride solution. The effect of this is to cause an enormous reduction in the cerebro-spinal fluid, as has been proved on animals. At about 4 P.M., when the tide of cerebro-spinal fluid is well on the turn, so to speak, flowing back to the subarachnoid space, the patient receives a full dose of an arsenobenzol compound, and, after being in bed all day, is allowed to go home at 9 P.M. Corbus and his colleagues found that, after five such treatments at weekly intervals, arsenic could be demonstrated in the cerebro-spinal fluid in 26 out of 28 cases, a higher percentage than has been attained by other means. I have no experience of this form of treatment.

TREATMENT OF TABES.

May I now mention the lines on which I would actually treat a case of tabes? Generally I would reserve intraspinal medication for cases which resisted the ordinary methods. That is, I think, common sense, as all forms of effective treatment make great demands on the patient, and lumbar punctures are not too pleasant an addition. I like best to combine intravenous injections with deep subcutaneous injections. For the intravenous I prefer silver-salvarsan to all others, and for the subcutaneous, sulfarsenol, because it hurts less. Patients vary greatly in their susceptibility to pain after sulfarsenol injections, but generally stand them well, especially if each is preceded with 0·5 c.cm. of 3 per cent. novocaine injected through the same needle. As mentioned, I start with very small doses, and watch to see how the patient tolerates them. For instance, 0·05 g. silver-salvarsan given intravenously is followed in three or four days by 0·12 g. sulfarsenol given subcutaneously. The dose is increased gradually to 0·3 g. silver-salvarsan, and 0·48, 0·54, or even 0·6 g. sulfarsenol until the patient has received about 2·5 g. silver-salvarsan and about 4 to 4·5 g. sulfarsenol. Then the injections are stopped for six to eight weeks while the patient receives, first a course of two or three weeks' iodide, and then yellow iodide of mercury by mouth. Sometimes I have to treat only with silver-salvarsan, and sometimes only with sulfarsenol, because the patient tolerates one of these better than the other. If sulfarsenol is the only arsenobenzol remedy, I give mercury by injection or by mouth at the same time, and I always give iodide at the end of the course. I always tell the patient he must expect to remain under treatment by regular courses of injections with intervals during which he will be taking some form of medicine, for quite two years, and if he is one who thinks that he will leave the decision as to further treatment to the result of the first course, I prefer that he shall go to someone else. I think that, if a patient will comply with the conditions, one can offer much in tabes, even though there may be a fair amount of ataxia. The halo of meningitis often disappears fairly quickly, and a particularly pleasing result of treatment with silver-salvarsan has been the disappearance of lightning pains. As a class I should say that the tabetics attend my department at St. Thomas's Hospital more faithfully than any other, mainly, I think, because of the relief given them in this direction. If a patient does not progress well enough or at all on the lines I have mentioned, I have in reserve for him intraspinal medication or else drainage, either, of course, combined with systemic treatment.

TREATMENT OF GENERAL PARALYSIS OF THE INSANE.

I should like now to say something on the treatment of G.P.I. In a British Medical Association[8] lecture I mentioned a case of G.P.I. which had done extraordinarily well on huge doses of silver-salvarsan combined with drainage. Briefly the details are these. I saw him first in an asylum in July, 1921, and gave him a few injections, after which he refused further treatment. A remission followed, and he was removed home. I resumed treatment about October, 1921, and pushed the doses up to about 0·6 g. silver-salvarsan, giving a total of 3·2 g. by Nov. 26th. Then I became nervous of the dosage and stopped the injections. After about two months' rest it became clear that he was relapsing and going steadily downhill. So I resumed treatment after about three months and gave him over 8 g. silver-salvarsan in ten injections, which finished in April, 1922. Under this treatment the relapse was stopped practically at once, and the improvement at the end of the course was most remarkable. He did not relapse in the next interval, and, commencing on July 2nd, 1922, I gave him a short intensive course of 3 g. silver-salvarsan in four injections and 2·88 g. copper sulfarsenol in six injections up to the beginning of September. I saw him a few weeks ago and he was in excellent condition. He requires no attendance, goes out to lunch and dinner, and no lay person who was ignorant of his history would detect any abnormality. Really, however, he is not mentally the same acute business man he was; he is just such a nice, quiet, pleasant-mannered gentleman as one often meets and classes as by no means a congenital idiot but not likely to set the Thames on fire. What is particularly pleasing is that his cerebro-spinal fluid, which was strongly positive at first, was normal when last examined. Assuming the disease has been arrested in this case, we are left with the irreparable damage it had done when we interfered. I have had some other cases, but have not had such a free hand as regards their treatment as in this case, and the results, though not unsatisfactory, have not been so good. The hope which such a case as this raises is for the patient who is pre-paretic or is in the stage where not much damage has been done. If it could happen that all persons with a history of syphilis had their cerebro-spinal fluid examined at regular intervals, or even if the medical profession had learnt well to have the cerebro-spinal fluid examined whenever a patient showed the least sign of central nerve disease, I think

[6] Brit. Med. Jour., 1922, ii., 37.
[7] Jour. Amer. Med. Assn., 1922, lxxviii., 264.
[8] Brit. Med. Jour., 1922, ii., 1.

we could save many a household from the misery, the financial loss, and, I may add, the shame which general paresis brings to it.

To summarise my address, I have tried more than anything else to emphasise the importance of thorough treatment in the first instance to prevent the late sequelæ of syphilis, thorough treatment when the only evidence of syphilis is in positive bacteriological findings, and thorough treatment when the patient has been allowed to develop one of those crippling or deforming late manifestations of syphilis which have made it the dreaded disease it is.

TUBERCULOUS AFFECTIONS OF THE TONGUE.

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IT is now over 100 years since a tuberculous lesion of the tongue was recognised and reported. Portal[1] in 1804 is generally credited with the description of the first case; for, though Morgagni[2] in 1761 mentioned a patient in whom tubercles were found in the tongue, yet this case cannot be accepted as proved owing to the lack of definition of the word tubercle as then used. Portal was followed by Louis[3] in 1825, Renaud[4] in 1831, Fleming[5] in 1850, Gildmeister[6] in 1851, and Paget[7] in 1858. In every instance the cases described were examples of lingual lesions secondary to pulmonary or laryngeal tuberculosis. In 1872, however, Enteneur[8] published the first primary case, and in 1876 Nedopil[9] followed with four cases which he claimed to be primary, but of these three cannot survive close investigation, and must be classed as secondary. Since then several cases have been published at intervals, so that in 1916 Scott[10] was able to collect 231 cases, including 26 claimed to be primary. From that date till the present time I have been able to find only two cases in the literature (Amorosi[11] and White and Marcy[12]). Just recently Pinel,[13] in his *Thèse de Paris*, reports 21 cases.

I have now to report five cases which have occurred in general surgical hospital practice (St. Mary's Hospital) within the last two years. Two of these patients presented themselves in the same week, and I was led to wonder if lingual tuberculosis is as rare a manifestation as is generally supposed. I have therefore written to 10 London general hospitals and 10 sanatoria asking for details of cases since 1910. This inquiry revealed only 12 cases, and it can justly be stated that at any rate in the environs of London lingual tuberculosis is a rare disease. Moreover, this would appear to be general throughout Europe and America, as Blancard's[14] figures suggest; for (1) in Blancard's own experience in 3935 autopsies on tuberculous subjects only 25 had lingual lesions, or 0·063 per cent.; (2) among 12,369 patients in German sanatoria only one tongue was affected, or 0·00008 per cent. (Hamel)[15]; (3) in the Winyah sanatorium in the United States 19 cases were found in 3000 patients (von Ruck).[16]

My cases presented several features of interest, and in that this subject is treated rather cursorily in the text-books of surgery, I was led not only to inquire into its frequency, but also to review it from the standpoint of the general surgeon. I therefore propose to deal with the subject in detail under various headings.

Ætiology.

(*a*) *Age.*—There appears to be no limit to the age incidence, for of the reported cases the oldest was 80 (Zintsmaster[17]) and the youngest 18 (Nicola[18]). The commonest decades are the fourth and fifth, and probably as many occur after 50 as before 30.

(*b*) *Sex.*—There is a very general agreement that males are more liable to be attacked than females. The ratio is variously given as 4 : 1 (Chrostek[19]), 5 : 1 (Schliferowitsch[20]), 23 : 1 (Delavan[21]), 5 : 1 (Nannini[22]), 3 : 2 in my series, and 5 : 1 in those I have collected from other sources.

(*c*) *Incidence.*—Undoubtedly the tongue is rarely the seat of invasion of the tubercle bacillus, which seems strange when the enormous incidence of tuberculous affections in general is considered. The reasons for this comparative immunity of the tongue are, first, the thickness and resistance of the mucous membrane; secondly, the marked antagonism of striated muscle fibres to bacillary invasion (with one or two exceptions—e.g., gas gangrene); thirdly, the constant flow of mucus and saliva cleanses the tongue; and, lastly, the continual movements of the tongue have the same effect.

(*d*) *Methods of Infection.*—The portals of entry for the tubercle bacillus are: 1. Direct inoculation. Injuries of the tongue may be directly infected and refuse to heal, giving rise to a tuberculous ulcer. Sinabaldi (quoted by Fulle[23]) describes such a case. 2. Inoculation from the sputum. This is by far the commonest method. 3. The blood-stream. 4. The lymph-stream. 5. Spread from neighbouring structures—e.g., the face, lips, tonsil, and naso-pharynx; this explains the occurrence of lupus.

Pathology.

There are no fewer than seven manifestations of tuberculosis in the tongue. Of these the best known is the ulcer, and little attention is paid to the others. These seven lesions are as follows:—

1. In generalised miliary tuberculosis the tongue may be studded with the typical small tubercles characteristic of the disease.

2. The tuberculoma or tuberculous granuloma. In recent years Murphy[24] and Mouisset[25] have each reported a case, and two of my cases are of this variety. Pinel states that only 20 examples occur in the literature. The mucous membrane appears normal in every respect, but beneath it there is formed a small tumour of slow growth, which is painless. It is usually not larger than a cherry-stone, is hard and not definitely circumscribed, and is fixed firmly in the substance of the tongue, the mobility of which is not impaired. It is usually seen projecting from the surface of the dorsum nearer to the edge than the mid-line. Microscopically the mucous membrane is intact and may be somewhat hypertrophied (Figs. 3 and 4). In Fig. 4 there is a very marked formation of "tubercles" lying closely packed together, so that there appears to be a definite tumour in the subepithelial tissues.

3. The cold abscess. This is a rare type, and since 1910 only two examples are recorded by Nannini[22] and Fulle.[23] It arises as a result of caseation occurring in a tuberculoma.

4. The ulcer. The commonest manifestation, which is situated on the side, tip, and dorsum in that order of frequency. In size it begins as a very small ulcer, and rarely attains the area of a florin. Its appearance is so typical that its recognition should always be possible by clinical examination. It is superficial, not deeply penetrating, and is lined by pale-yellow granulations, exuding a yellowish pus. The edges are not undermined and are sinuous in outline—the ulcer being nearly circular—and the walls slope gradually to the floor, which when cleaned of the pus shows the typical weakly pale granulations. There is little or no induration around, until there is an established secondary infection. Around it—and here is the most illuminating feature of all—is a ring of satellite tubercles, which are quite small, and usually need a magnifying glass for their demonstration.

5. The fissure. These may occur as the only lesion in the tongue, or, as more frequently happens, may be present with an ulcer. They are found along the edges rather than on the dorsum, and at first sight they appear as quite insignificant cracks in the surface of the mucous membrane; but if the edges are separated their depth is surprising, and they will

be seen to be lined with the pale greyish granulations exuding a thin slight discharge. No induration will be found around them except in the presence of a secondary infection.

6. The papillomatous or verrucose type. The former is described by Clayton-Greene[26] as an inflammatory hyperplasia of the mucous membrane in the neighbourhood of a fissure giving the appearance of a true papilloma. The latter is described by François Dainville,[27] and is of the same nature.

7. Lupus of the tongue. The tongue is attacked by lupus vulgaris by direct spread either from the skin of the face or from the naso-pharynx. It is quite a well recognised complication occurring in 15 cases in 1000 at the Licht Institute, Copenhagen (Strandberg[30]). In its pathology it differs in no way from lupus elsewhere, being confined to the epithelium. In the tongue it presents a pinkish-grey raised plaque without any inflammatory reactions, and is firm and hard. It may retain its sclerotic characters, and is then known as "glosso-dermatitis tuberculo-fibrosa," or it may break down into the surface ulceration typical of cutaneous lupus, and is termed "glosso-dermatitis tuberculo-ulcerosa" (Duranti[28]).

Symptoms.

It will be readily understood that the symptoms will vary with the pathological type. The tuberculoma and cold abscess will present painless swellings which give rise only to inconvenience or, at the most, discomfort in talking or swallowing. The ulcer, on the other hand, makes its presence most unmistakably felt. It is an exquisitely painful and tender lesion. The discharge is not sufficiently copious to be a source of discomfort, but talking, eating, and drinking are reduced to a minimum on account of the pain. In addition, there is in some cases profuse salivation. The question of the involvement of the lymphatic glands is vexed, and perhaps the balance of opinion is against a resulting adenopathy in the neck. My experience is the reverse, and not only is there no reason why it should not occur, it is, rather, a natural sequence of events.

Diagnosis.

There can be no doubt that these conditions give rise to many difficulties in diagnosis, and the tendency on the part of many observers has been to consider a microscopical examination as essential to a definite opinion. To that view I must take exception, and I should approach the problem from several aspects. In the first place the differential diagnosis of the tuberculoma and the ulcer is quite different and must be discussed separately.

1. *The Tuberculoma.*—The following conditions give rise to localised swellings in the tongue:—Lipoma, fibroma, myoma, neurofibroma, endothelioma, sarcoma, carcinoma, teratoma, gumma, and actinomycosis.

The encapsuled benign neoplasms will differ from the tuberculoma in that they are movable within the substance of the tongue. The malignant ones are harder and more rapidly growing, and will have more surrounding induration. The early gumma and actinomycosis may present the greatest difficulties, for at certain stages their clinical appearances may be very similar. But they both break down more rapidly, the one into the typical gummatous ulcer, and the other into multiple sinuses discharging the sulphur granules.

One other aid to clinical diagnosis exists, and that a most valuable one. In an overwhelming majority of cases there exists a coexistent tuberculosis of the lungs or larynx, even if entirely unsuspected. Attention may here be drawn to two of my cases (Nos. 2 and 4), for in neither of these patients was there anything to draw attention to the possibility of pulmonary tuberculosis, both strongly denied any of the stigmata of tuberculosis, and neither had been off duty for years; yet the clinical examination of the lungs showed definite evidence of lung involvement, which was confirmed by radiology. Therefore a careful examination of the lungs and larynx should invariably be done, and in the great majority the clue to the diagnosis will there be found. I would here lay it down in this connexion that no case can be accepted as a primary infection unless this has been done. Many of the claimed primary cases reported bear very slight investigation; the existence of a true primary case seems to me more than a little doubtful. It would have been easy to claim my two examples of tuberculoma as primary cases, if no examination of the lungs had been carried out. The reason that these patients go undiagnosed or misdiagnosed is that the possibility of the lesion being tuberculous is overlooked.

2. *The Ulcer.*—Lingual ulceration has many causes, but for all practical purposes three need to be differentiated from the tuberculous, viz.: (*a*) traumatic or dental, (*b*) syphilitic, and (*c*) carcinomatous. It is frequently taught that the tuberculous ulcer has the following characteristics—that it occurs at the tip, is multiple, and is seen in the last stages of pulmonary tuberculosis. Nothing could be more fallacious. The ulcer is not often multiple, not infrequently the lung infection is latent, and though it may occur at the tip, it is more often seen on the edges opposite the molar teeth. Once again I would plead for a more accurate observation of the findings, for therein is the diagnosis to be read. I have already described the ulcer, and would draw attention to the satellite tubercles. Perhaps the simplest way of contrasting the physical signs of these four types of ulcer is in a table.

I would once again emphasise the importance of examining the chest in every case.

CONTRASTING PHYSICAL SIGNS OF FOUR TYPES OF ULCER.

—	Tubercle.	Traumatic.	Syphilitic.	Neoplastic.
Depth.	Shallow.	Varied.	Deep.	Deep.
Colour.	Yellow-grey.	Pinkish-yellow.	Grey.	Dirty grey.
Edges.	Sinuous and not undermined.	Indurated.	Ragged and undermined.	Raised and everted.
Sides.	Sloping.	Sloping.	Punched out.	Ragged and sloping.
Floor.	Pale yellow granulations.	Sloughing.	Yellow-grey slough.	Necrotic.
Induration.	Nil.*	Present, not marked.	Present.	Marked.
Pain and tenderness.	Very marked.	Marked.	None.	Slight; sometimes referred pain severe.
Local causes.	Nil.	Dental caries, &c.	None.	Unknown.
Other signs.	Fissures, sentinel tubercles and pulmonary tuberculosis.	Nil.	Leucoplakia.	Nil.

* Present with the onset of secondary infection.

Supplementary Methods of Diagnosis.

In that accurate diagnoses are not always arrived at, however careful the clinical investigation, it is right that subsidiary aids to diagnosis should be made use of. We have the following methods at our disposal:—

(1) Tuberculin tests; and (2) the von Pirquet reaction. (In my opinion these tests are quite valueless, and no reliance should be placed upon them.) (3) The complement-fixation test is at present being tried out, and Punch and Gosse[29] has published an encouraging preliminary report. As yet no expression of opinion as to its efficacy is possible. (4) Examination of a smear of discharge, and debris from the ulcer

may reveal the presence of the tubercle bacillus. (5) Histological examination is conclusive, and as seen in my sections is typical; tuberculous granulation tissue, "epithelioid" cells, and giant cells are always to be seen. It is not easy to demonstrate the bacillus in the tissues, owing to difficulties in staining and decolourising tissue sections. One detail in technique is important in removing pieces of tissue for histological purposes. When one is dealing with a tuberculoma, the whole tumour must be excised and the gap in the tongue closed by sutures. If only a portion be removed the lesion rapidly breaks down and one is confronted with an ulcer, leaving the patient worse off than before. (6) Inoculations

FIG. 1 shows an ulcer with a necrotic base, the mucous membrane at the periphery being hypertrophied. Numerous giant-cell systems are seen surrounded by a small round-cell infiltration. The muscular tissue of the tongue is invaded and is being destroyed. There is considerable formation of collagen fibre. Occ. Zeiss x2, obj. Leitz 1, tube length 150 mm.

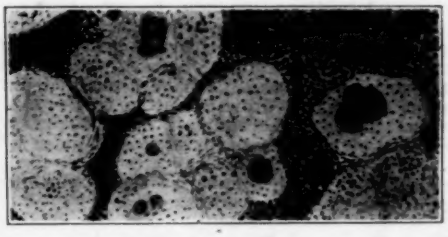

FIG. 2.—Section of lymph node from same case as Fig. 1. Shows a well-marked tuberculous involvement of the node. Numerous giant-cell systems are present, as well as many areas of masses of epithelioid cells without giant cells. Occ. Zeiss x2, obj. Zeiss 26 mm., tube length 160 mm.

of suspensions of suspected material into guinea-pigs. This is an infallible proof, but it takes some considerable time to carry out.

Treatment.

Treatment must obviously vary with the type of case. It must be kept in mind that the lesion is secondary, and that therefore nothing is indicated but the destruction of the local condition. The tuberculoma should be completely excised and the gap sutured. This can be done easily by taking a wedge from the tongue, and this equally applies if the diagnosis is in doubt and the excision is for histological purposes. It is found that the incision heals firmly without ulceration. The ulcer is not so easy, for local excision and suture does not give a clean result, the wound breaking down, leaving a larger tuberculous ulcer than before. Local applications are recommended by various authors, such as bipp, lactic acid, chromic acid, &c., but they do little good. The best treatment is the destruction of the ulcer by electro-coagulation by means of the diathermy apparatus. The resulting scar is firm without contraction, there is no pain after the operation, and the wound heals with less tendency to reinfection than any other method. The Pacquelin and galvano-cautery give fair results, but do not approach diathermy.

Lupus.—The treatment of lupus of the mucous membranes in general has been greatly advanced by the work in the Licht Institut, Copenhagen. There these cases are treated by "ionisation reversed," which is carried out by giving the patient large doses of sodium iodide by mouth for three days, and then applying the positive pole to the tongue. In this way the required agent is drawn from the tissues through the diseased area. The results, I understand, are admirable. I would suggest that it would

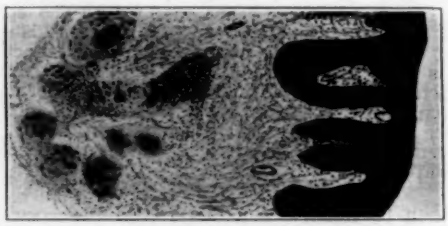

FIG. 3.—Section of tongue showing slight hypertrophy of mucous membrane. In the submucous tissues and invading the muscular tissues of the tongue is a small collection of "tubercles," including three with well-marked giant-cell systems. There is a considerable round-celled infiltration in two definite areas, and throughout the section there is much collagen fibre present. This is typical of a tuberculoma. Occ. Zeiss x2, obj. Zeiss 26 mm., tube length 160 mm.

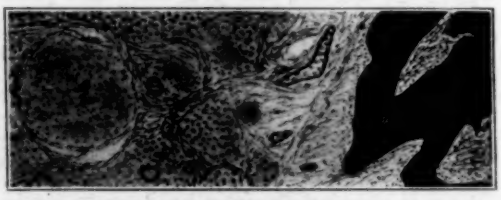

FIG. 4.—Here there is some hypertrophy of mucous membrane. The main bulk of the drawing and, indeed, of the whole section consists of a mass of "tubercles." Large numbers of epithelioid cells are irregularly divided up by collagen fibres, but there are only two giant cells present in the field, and two others in process of formation. The whole section presents exactly the same picture. This is another example of the tuberculoma, but the difference between this and Fig. 3 is most striking. Occ. Zeiss x2, obj. Zeiss 26 mm., tube length 160 mm.

be well worth while trying the effect of the diathermy current here also, for it has already been used for cutaneous lupus with success. In that the tuberculous lesion of the tongue is secondary to pulmonary phthisis, it must be borne in mind that general treatment should be begun at the earliest opportunity.

CASE 1.—Male, aged 59. (Service of Mr. W. H. Clayton-Greene.) First seen in October, 1920, complaining of an ulcer on the tongue. Seven weeks previously he had bitten his tongue, and very shortly after a little lump appeared at the same place. This gave him no pain, but had been a source of inconvenience, and smarted somewhat when he smoked. One month later the lump broke down into a very painful open sore. On examination there was found an ulcer about the size of a sixpenny-piece on the left edge of the tongue opposite the first molar tooth, having indurated and everted edges. There was much dental caries, and the glands in the left submaxillary and carotid triangles were markedly involved, and, in addition, there were two palpable glands in the right submaxillary triangle. The condition was confidently diagnosed as carcinoma, the patient was sent to the examination for the M.R.C.S., and the diagnosis went unquestioned by the Board of Examiners. The man, though exhaustively questioned, had no history of any pulmonary affection, and when examined prior to operation the lungs showed no clinical signs of any morbid lesion

On Nov. 3rd half the tongue was removed by Mr. Clayton-Greene, and an extensive dissection was made of the glands of the left side. Eight days afterwards the patient began to cough, and the histological examination, having revealed the error in diagnosis, the sputum was found to be heavily infected with tubercle bacilli. Physical signs of broncho-pneumonia were now present, and on Dec. 6th he died from double tuberculous broncho-pneumonia, the autopsy showing extensive changes in both lungs, and many lesions in the trachea, larynx, and ileo-cæcal region. Fig. 1 shows the histology of the ulcer on the tongue, and Fig. 2 one of the glands.

CASE 2.—Female, aged 42. Seen by me as an out-patient in August, 1921, having noticed a small swelling on the side of the tongue for some weeks previously. It had not been painful, but had annoyed her because she was always conscious of it. She presented a swelling the size of a split pea on the left side of the tongue opposite the second molar tooth. The mucous membrane was intact over it and appeared normal. The lump itself was firm and regular in outline and fixed to the lingual parenchyma. There were several satellite tubercles, and one definitely enlarged gland was palpable in the left submaxillary triangle. She had no history of any pulmonary affections, and insisted that since 1910 she had not been off duty for one single day. Before that date she could remember no illnesses. However, Prof. F. S. Langmead examined the chest and reported "over the right apex in front and in the axilla there is loud breathing and prolonged expiration; behind the same with increased vocal resonance, and fremitus and whispering pectoriloquy." The radiograph showed very clear evidences of invasion of the right apex with cavitation, and Dr. G. Harrison Orton had no doubt as to the tuberculous nature of the infection. The swelling was removed and the gap was sutured. The histology is shown in Fig. 3.

CASE 3.—Male, aged 28. This patient was sent to my out-patients' department from a sanatorium with an ulcer on the edge of his tongue opposite the second molar tooth on the right side. The medical superintendent of the sanatorium had diagnosed a tuberculous ulcer, but the patient desired a second opinion, his father having died of carcinoma of the tongue. There was a small ulcer on the margin of the tongue (diameter ¼ in.), very painful and tender, and showed all the characteristics of the tuberculous ulcer, including the satellite tubercles. He was under treatment for pulmonary phthisis at the time. In view of the patient's anxiety a piece was removed for microscopy, and the findings were typical.

CASE 4.—Female, aged 37. This patient was seen in May, 1922, by my colleague, Mr. D. C. L. Fitzwilliams, by whose courtesy I was enabled to see the case. Three months ago she had noticed a small grey swelling on the under surface of the tongue exactly in the mid-line and ¼ in. behind the tip. This had not worried her, but two months later she noticed that the swelling was becoming evident on the upper surface in a corresponding position and has been steadily growing since. It now bothers her because of its presence in the mouth. There was nothing in her past history suggestive of any pulmonary affections, but there was a bad family history. A lump was found which spread through the whole thickness of the tongue, ¼ in. behind the tip. The mucous membrane was intact; several satellite tubercles were easily seen by the magnifying glass. There was one definitely enlarged gland in the left submaxillary gland. The lump was removed by wedge incision and the gap sutured. Histology is seen in Fig. 4.

CASE 5.—J. N., male, aged 42. This patient was admitted in the terminal stage of pulmonary phthisis, and had an extensive ulceration of the tongue and a foul condition of the mouth generally. The ulcer was larger than usual, but was otherwise typical. Unfortunately no autopsy was possible, so no specimen was available. There were many enlarged glands in the neck.

In conclusion, I would say that the figures have been drawn with the Zeiss camera lucida. It may be recalled that THE LANCET in a recent leading article drew attention to the markedly unsatisfactory nature of micro-photographs and pleaded for actual drawings. I have therefore made the latter, and I have to thank Dr. E. H. Kettle for giving me facilities for work in his laboratory, and for kindly advice with the drawings. I have also to thank Mr. W. H. Clayton-Greene and Mr. D. C. L. Fitzwilliams for permission to publish cases; and to the former my grateful thanks are due for his inspiration and encouragement during the past three and a half years in which I have had the privilege of association with him in some of his surgical work.

(*Continued at foot of next column.*)

FORMS OF TUBERCULOUS ARTHRITIS AND THEIR TREATMENT.*

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THE best way to introduce the subject is to start from the cases mentioned below and develop the theme as we proceed. By sternly limiting the cases cited, an effort has been made to avoid obscuring the wood by the trees.

I do not wish to be dogmatic, or to speak as an authority, or to claim any finality for what is said. I am only groping in the dark, dissatisfied with the present classification and treatment of tuberculous arthritis, and trying to evolve something better in the light of the clinical material which comes to my notice. I have tried to widen my views on these matters not only by visits to the best-known special institutions for surgical tuberculosis, but also by visiting various general and special hospitals in London and the provinces, and by the observation of new methods, however heterodox and unconventional.

Polyarticular, Suppurative Type.

CASE 1.—Male. Polyarticular tuberculous arthritis of the suppurative type. At the age of 1 year the extremities swelled. Various operations were performed on the hands, feet, and elbows, while some sinuses appeared spontaneously. When he was about 7 all the joints cleared up, and have remained healed, but much deformed since. When 8 and 9 he suffered from pleurisy. When 11 he had tuberculous meningitis, with vomiting and marked head retraction. He was 11 weeks in bed but made a good recovery. When 16 a cough developed, and there was hæmoptysis, which has recurred since, and definite physical signs were found in the chest.

There is now (at 20) much scarring and deformity of the fingers and toes, hands, feet, and elbows. There are also tuberculous scars on the left thigh and buttock, and a nodule in the right globus minor testis.

* A paper read before the Plymouth Medical Society on Oct. 26th, 1921.

(*Continued from previous column.*)

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FIG. 1.

CASE 1.—Results of polyarticular tuberculous arthritis of suppurative type.

The combination of suppuration and high resistance to tuberculosis seen here seems to be usual. A case of tuberculous meningitis that gets well is no longer considered one of the medical wonders of the world.

CASE 2.—Male. Another example of the suppurative type. The left knee swelled when the patient was a boy of 19, and tuberculosis was diagnosed. An abscess formed and was opened two months later. Then the neck and the right ankle swelled and discharged, and abscesses appeared over the left sixth and seventh ribs. At the age of 20 the left ankle swelled, but subsided, and in a few weeks was normal again.

At 21 an abscess appeared in either groin and the patient was admitted to hospital with 22 sinuses, in a condition that appeared hopeless. No splints were applied, and no method of extension was used; he was just fed, and kept clean and cheerful; his disposition was a great help. After hanging fire for some time he began to improve. The sinuses commenced to heal, but contraction of the knees and right ankle occurred; the left knee became flexed to a right angle, riddled with sinuses. The patient was discharged after one and three-quarter years in hospital with five sinuses (right ankle, left knee, and both groins), but able to get about on crutches, and his deformities already improved by his efforts to walk and to straighten the limbs in bed. Sixteen months later all sinuses had healed, the joints appeared functionally normal, and the patient was about to obtain work. The left knee, though it could be flexed and extended almost normally, required more muscular effort than normal for this movement and gave rise to a grating noise audible 10 to 12 yards away.

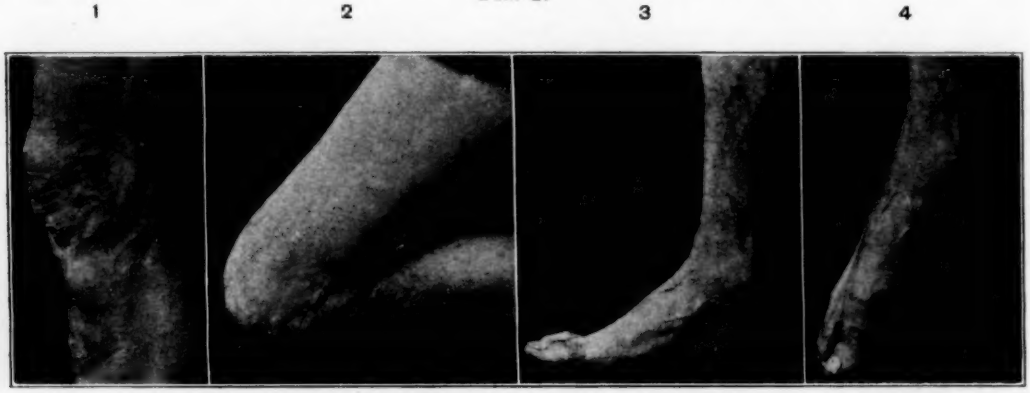
I would like to emphasise the more or less transient swelling of one ankle, as we shall have occasion to return to this shortly. The remarkable functional recovery I attribute to the attempts to straighten the limbs being made while the joints still discharged and the fibrous tissue was still young.

CASE 3.—A married woman, in whom tuberculosis of the left hip, with suppuration, occurred at the age of 29. A year later there was hæmoptysis and spinal caries, and the patient was kept in bed for seven months. At 31 she was confined and three months later hæmoptysis recurred, also the left hand swelled, and was operated upon, healing within three years. At 34 the right hand swelled and was operated upon. Vomiting and gastric trouble next supervened, and for three years the patient was ill in bed. A laparotomy at 38 revealed tuberculosis of the stomach. At 40 there was an attack of pleurisy. At 41 the right arm and hand swelled and discharged. The three inner fingers of the right hand were removed at 42. Later there was pleurisy, and diarrhœa commenced. At 43 the left ankle swelled and was painful, but became quite well in a few months without special treatment. The right shoulder became painful and stiff at 44, and then the left. At 46 major tuberculosis of the right hip occurred, there was much pain, a sinus formed after a while, and a piece of bone came away. At 47 there was vomiting and hæmatemesis, pain in the right foot and hip, and another abscess formed in connexion with the right hip. At 48 she had tuberculous meningitis and was unconscious for a week, but she made a good recovery, and at 49 still lives. It cannot be said that the several operations were of any real benefit to this patient.

CASE 4.—Female, had pleurisy with effusion at 16. The left elbow swelled and discharged at 17, as did also the right wrist, after two aspirations. This wrist healed with a perfect functional result in about three months, and has not relapsed. At 18 there was pain and swelling of the right shoulder which subsided in a few weeks. Later in that year she was delivered of an illegitimate child; this delivery was followed by a severe relapse with remittent pyrexia, emaciation, and a copious discharge from the left elbow, which became flail. The shoulders and the right elbow became also affected, but cleared up rapidly and perfectly without special treatment, except the right shoulder, which remains stiff. The left elbow was put up in plaster in the extended position, and unfortunately is now ankylosed in that position. At 21 she married, has now just been confined a second time, and is in good health.

CASE 5.—Male, when 16, developed a tuberculous abscess in the upper and outer part of the left forearm, which was opened. The dorsum of the left hand then became affected, then the left great and second toes, which opened spontaneously. At 17 the left ring-finger became diseased, and at 18 an abscess formed over the inner side of the left hand, and another over the right wrist, which burst, leaving sinuses. Two toes were removed. The axillary glands were next noticed to be affected, and a swelling of the left knee developed, for which nothing was done, but which subsided in a few weeks. The patient wore splints for the wrists on and off for a few months. He worked intermittently, even when splinted; at 21 he commenced regular work as a shop-assistant, and has continued since. The wrists were then still troublesome, but are now healed, with a good functional result.

FIG. 2.



CASE 2.—After four years. (1) Knee extended. (2) Knee flexed to show functional recovery. (3) Ankle dorsiflexed. (4) Ankle extended.

Monarticular, Major and Minor Types.

The consideration of the above cases leads us to minor tuberculous arthritis, a condition which has escaped definite recognition, though many surgeons tell me they suspected its existence. We have seen the occurrence of arthritis in one or more joints, in

patients undoubtedly tuberculous, which yet clears up rapidly and spontaneously. Other joints apparently exactly similar progress to a major tuberculous arthritis. We will now consider cases in phthisical patients, and others, where the disease was monarticular and minor, and yet seemed clearly tuberculous.

CASE 6.—Boy of 7, with a tuberculous father, and living under bad home conditions, developed definite rigidity and tenderness of the dorsilumbar spine; he was notified as tuberculous and seemed a typical case of early Pott's disease. The boy had also extensive enlargement of the cervical glands, which was considered tuberculous. In three months, although no special treatment had been adopted, there remained only a slight stiffness. One year later the spine seemed normal.

CASE 7.—Female child, living with a tuberculous grandmother and aunt, was operated upon at 2 years for tuberculosis of the left thumb, left great toe, and left epitrochlear gland. At 3 she developed a limp, pain in the left hip, and weakness of the left leg. There was no obvious deformity or loss of movement and the child was well in two months.

CASE 8.—Female, aged 35, who had been in a sanatorium for phthisis (stage 2), and whose sister has a tuberculous knee, developed pain and stiffness of the left knee. When seen there were a slight fullness and tenderness on the inner side of the joint, but in a month or so it again seemed normal.

CASE 9.—Female, under treatment at 12 years of age for a tuberculous hip. For one month she was confined to bed, then seemed better and got about again, remaining only a little lame. At 32 this patient developed phthisis, with a positive sputum; there was then a just discernible stiffness of the left hip.

CASE 10.—Male, with a tuberculous wife, had swelling of the left knee at 33, diagnosed as tuberculous. Scott's dressing was applied for six weeks, then plaster for eight weeks. The joint then appeared well, and he commenced to use it; within two weeks a slight effusion recurred; movements, however, remained free and painless. A week or two later the joint was normal again, and has remained so for six years.

CASE 11.—Male, a labourer, aged 33, came to my surgery, when I was in practice, complaining of pain in the back, and indicated the region of the right sacro-iliac joint. On separating the iliac crests slight but definite pain was referred to that joint. I made some notes, entering as the diagnosis "sacro-iliac arthritis," and treated him symptomatically. He returned to work about a week later, and worked regularly for some two years. He then developed an obvious tuberculosis of the right sacro-iliac joint, which I trephined and scraped, and later treated him with tuberculin. The patient did not do well, suppuration spread into the buttock and down the thigh, but he made a good recovery after four years in hospital, during which he was sometimes extremely ill, and has now worked regularly for seven years. His disability is negligible. No merit is claimed for the treatment, but it was considered to be up-to-date at that time. Here a minor tuberculous arthritis became major after two years.

CASE 12.—A boy of 4 had pain in the left hip and limped. His father, who had lost two brothers with tuberculous hips and had, to some extent, lost faith in doctors, kept him lying down for a few days, then allowed him gradually to get about again. There was no further trouble in that joint; but two years later this boy developed major tuberculosis of the right knee, which ended in resection of the joint.

When calves are injected with living tubercle bacilli for experimental purposes I am informed that they sometimes develop a more or less transitory swelling of one or more joints. Fluid from these joints has been found to cause tuberculosis in guinea-pigs, and in some of them appearances indicating tuberculosis have been found post mortem.

I consider the case proved for minor tuberculous arthritis, and would sum up the proofs thus:—

1. The occurrence of more or less transient joint swellings in patients with several joints obviously affected.

2. The occurrence of what appear to be definite tuberculous joints in tuberculous subjects, which yet clear up rapidly and spontaneously.

3. The fact that some such joints may get well and then relapse, ultimately to become typical cases of major tuberculosis.

4. Animal experiments.

It must be borne in mind that between major and minor tuberculosis there is no sharp line and that all grades of intermediate cases may be seen.

Now consider other polyarticular forms of tuberculous arthritis.

(A) *Polyarticular Rheumatoid Type.*

This type closely simulates rheumatoid arthritis.

CASE 13.—A labourer, aged 55, with three tuberculous children, one of whom has since died, was seen as a contact, in bed, with "rheumatoid arthritis." He had been ailing for four or five years, getting thinner and short of breath. For nine months there had been pain in the right hip, and for a lesser period in the other hip, elbows, shoulders, knees, and wrists. The joint pains were severe. Pulmonary tuberculosis was obviously present, and there were fusiform swelling and tenderness of all the larger joints and some of the interphalangeal joints, but for the most part these escaped. He died of hæmoptysis one month later.

CASE 14.—Female, seen as the contact of a tuberculous daughter, who has since died. At 41 there were pain and swelling of the right elbow, then the right ankle, and by 42 the knees, elbows, shoulders, wrists, and ankles were very tender with a slight effusion into the joint and periarticular thickening. The condition was typically "rheumatoid." At 44 the carpometacarpal joint of the right thumb became affected; there was also pulmonary tuberculosis, with a positive sputum. At 45 several finger- and toe-joints were affected, and also the spine, but the atlanto-axoid joint and the hips still escaped. She died at 46.

(B) *Polyarticular, Osteoarthritic Type.*

In this the fusiform swelling, the sweating, and general symptoms of rheumatoid arthritis were absent; but lipping of the ends of the bones, and the appearance of the joints would justify a diagnosis of osteoarthritis. I believe the joints which my chief used to show me, when house surgeon, as "osteo-arthritis becoming tuberculous," were really examples of this type of tuberculous arthritis.

CASE 15.—An alcoholic steelworker was troubled at the age of 33 with swelling of the right knee. There was not much pain, but the swelling increased, lipping of the bones developed, and at 34 an operation was performed and some Baker's cysts removed. He resumed work but the other knee became affected, and at 37 I removed some Baker's cysts on that side; the appearance of the fluid was that usually associated with tuberculous joints. However, he was much improved and worked again for over a year, when gradually increasing swelling of the knees again incapacitated him. This time the fluid was aspirated and firm pressure applied, after which the patient resumed work for another year. Swelling then recurred, and pyrexia; signs of pulmonary tuberculosis were found, and later a pleural effusion formed, and swelling and pain took place in other joints—ankles, shoulders, wrists, hips, and elbows. The patient died of tuberculosis at 41.

CASE 16.—Male, with somewhat extensive signs of pulmonary disease, complained, at 23, of intermittent swelling of the fingers, knees, shoulders, elbows, and wrists. When first seen there was pyrexia, 100·5° F., a pulse-rate of 132, and respiration-rate of 24, but the joints were not then swollen. Three months later swelling of the right hand was found, and one year later the right wrist, right ankle, and the small joints of hands and feet were affected. There were stiffness and pain but no deformity.

CASE 17.—Female, as a girl of 13 had a tuberculous left hip and was under treatment for four years before arrest of disease took place with ankylosis and shortening. Lung symptoms and signs developed at 21, and a few years later abdominal tuberculosis led to two months in hospital for intestinal obstruction. Later again this patient was in bed 10 months for "gastric ulcer." Then other joints became affected with a condition diagnosed as "osteoarthritis," for which the patient underwent treatment in different institutions. At 30 there were signs of somewhat extensive pulmonary tuberculosis. There was fibrous ankylosis of both knees and right wrist and shoulder, also stiffness and pain of varying degrees in the ankles, left shoulder, and jaw.

(C) *Polyarticular, Arthritis Deformans Type.*

Arthritis deformans is often described as a different entity from osteoarthritis as generally recognised. The following are cases of tuberculous arthritis deformans:—

CASE 18.—A sailor of 18 injured his right knee, which swelled up a few days later, but did not prevent work. Three months later he had to lie up, and was admitted to

hospital six months after the onset, with the diagnosis of tuberculous knee, urethral sources having been carefully eliminated. He was treated with tuberculin. Subsequently swelling occurred of the left wrist, right elbow, and left knee. There was a local and general reaction to each dose of tuberculin. I saw him at 19 with an effusion into both knees, left wrist, and right elbow, and a pyrexia ranging from 98°–101°. At 20 the right shoulder and jaw, both hips, ankles, knees, wrists, and right elbow were affected. The pain was very severe, the patient helpless and bed-ridden. Later pleurisy developed, then swelling of both ischial bursæ. At 21 there was left iridocyclitis. Extreme deformities of feet and hands gradually took place. The tibiæ became displaced backwards and outwards on the femora to a remarkable extent, obstructing the popliteal vessels, and causing in the end, at 24, gangrene of both legs, from which this patient died.

CASE 19.—Male, aged 21, was under treatment during two and a half years for tuberculosis of the right hip. At 27 there was a first hæmoptysis, and swelling occurred of the left middle finger, left ankle, and right knee. From this time onwards a cough and joint pains were a constant trouble. At 39 the cervical spine became affected as well as the joints already enumerated, and an osteophyte was noticed on the inner side of the left ankle. At 40 an osteophyte was noticed in the right groin. At 42 all interphalangeal joints were affected and ulnar deflection commenced. Now, at 44, exacerbations of lung or joint trouble still occur, and there is occasional hæmoptysis. This patient carries on intermittent work as insurance agent. Rest in bed improves his general condition rapidly, but makes his joints stiffer and more painful, so he prefers to remain about when physically possible.

Next consider the type of case to which the name tuberculous rheumatism may justly be applied. The condition may occur as fleeting joint-pains, or swellings, in tuberculous subjects, or we may get the picture of an attack of acute rheumatism, which, however, does not yield to salicylates.

CASE 20.—Female, aged 24, with pulmonary tuberculosis of medium extent, was in bed for three months, suffering from what seemed typical rheumatic fever. There were pyrexia, swelling, and pain of the joints which flitted from joint to joint. She made a good recovery; she has married twice since then and has had no further joint trouble.

Lastly, consider a series of cases which may be bunched together under the heading—

Aberrant Forms of Tuberculous Arthritis.

1. *Intermittent Hydrarthrosis.*

CASE 21.—A boy of 13 developed a swelling of the left knee. He recovered after five weeks and remained well until 15, when there was again swelling of the knee lasting a few weeks, and also a somewhat extensive pleurisy and physical signs of pulmonary tuberculosis were discovered.

I also remember a girl of about the same age in whom both knees were swollen intermittently and the diagnosis seemed to be tuberculosis, but in this case we had not the support of a pulmonary lesion.

2. *Extra-articular Arthritis.*—In these cases I think the main joint cavity remained clear, and the disease was confined to bone on the outer layers of the synovial membrane.

CASE 22.—Female, aged 17, whose right knee began to give way and was found to be swollen. She had been in bed five weeks when I saw her, and the knee was hot and stiff, but only swollen on either side of the ligamentum patellæ. A back splint had been applied. The patient remained in bed three weeks longer, then was about in a bath-chair for four weeks, after which she discarded the splint and began to walk. An abscess formed and discharged, leaving two sinuses. The sinuses healed in eight months, while the girl continued at work as a shop assistant, wearing a bandage only. The joint remains cured and functionally perfect after an interval of three years.

CASE 23.—Female, aged 16, twisted her left knee; some weeks later gradually increasing pain and swelling occurred. Eight weeks after the injury the patient had to lie up. I saw her two months later again, there were pain and some stiffness of the left knee, and a swelling on the outer side anteriorly below the midpatellar level which seemed in the synovial membrane. Gradually the swelling softened, and burst a few weeks later. The sinus closed in a few weeks and, except for a scar, the joint is now normal two years after the illness.

3. *Dry Ankylosing Arthritis of the Shoulders.*—This condition occurs not infrequently in phthisical patients.

CASE 24.—Female, aged 55, with moderately advanced phthisis; her mother, two brothers, and two sisters had died of phthisis. She was sent to a sanatorium and from there to an asylum because of mental trouble. She married after a few months at the asylum, at 57; 18 months later there were fibrous ankylosis of the left shoulder and partial ankylosis on the right side.

One might also include in this class cases of *capricious resistance*, in whom the resistance seems to vary within wide limits with, or without, a definite cause.

CASE 25.—Female, aged 21, who had suffered from cough and a "weak chest" since 14 and had never been able to work, developed an exacerbation of her phthisis after the birth of an illegitimate child. The left knee became tuberculous a few months later, and when seen six months after the confinement was a typical tuberculous knee. No splint was used, but the patient was confined to bed with pyrexia for about six months. She then got up and began to get about again, and soon after took a daily situation as nursemaid. Nine months later the disease of the knee was quiescent.

Classification.

The classification I would propose, then, for tuberculous arthritis comes under four main headings:—

1. Monarticular tuberculous arthritis, which may be subdivided into (*a*) major, and (*b*) minor arthritis.

2. Polyarticular tuberculous arthritis, which again may be subdivided into the following types: (*a*) suppurative, (*b*) rheumatoid, (*c*) osteoarthritic, (*d*) arthritis deformans. (*c*) and (*d*) may, indeed, be included in one sub-group, but as some would differentiate between them, I have made two headings.

3. Tuberculous rheumatism.

4. Aberrant forms of tuberculous arthritis.

It is not claimed that this classification is anything more than a mnemonic, as are all classifications. The classification adopted by Poncet and Leriche, whose monograph on this subject I purposely did not read until my own conclusions had been reached from clinical observation, seems much too complex; and far from serving as a mnemonic would itself need a similar aid. Moreover, though Poncet and Leriche give a most interesting series of observations, they claim more, I think, for tuberculosis than is justified; in this paper only cases observed personally are included.

Treatment.

Attention will be confined to the first group and sub-group, major monarticular arthritis—that is, tuberculous arthritis as universally recognised; otherwise we should be led too far afield.

First, it is generally acknowledged that the results of operative measures are bad, and that these should only be resorted to exceptionally. It will also be admitted that in the presence of active disease, accompanied by pain and muscular rigidity, rest in bed and extension are the best remedies until activity subsides. The extension should be in the axis of the limb segment below the deformed joint and is gradually altered as the limb strengthens. Theoretically it is harmful to apply extension in any other way, but Nature is very adaptable, and I have seen relief follow so often when this rule was disobeyed that it cannot be considered essential, only preferable; and in the case of a deformed spine no method of extension can really succeed in this. It is, however, open to discussion if the aim of treatment should be *ankylosis of the joint in a suitable position* as is frequently stated, when so many untreated, or partially treated cases end in arrest of the disease and yet a functionally perfect result. Complete immobilisation, as in plaster, has its dangers.

CASE 26.—At the end of one December a healthy, robust female of 30 slipped from a stool on to the flat of her right foot. Pain followed, but the patient continued working for a few days, until increased pain temporarily prevented her using the foot. It was bandaged and immobilised in splints, but when they were removed pain remained, and finally for two to three months plaster was applied as tuberculosis was suspected. I saw her the next May, at which time she was confined to a bath-chair. The right leg and foot were cold, blue, and œdematous, and movements were painful, but there was no muscular rigidity. The condition seemed purely functional and not tuberculous. X rays confirmed the diagnosis, but showed a remarkable thinning

and lessened density of all the bones of the affected foot. Massage, passive and active movements were adopted and persevered with, in spite of pain and discomfort. The inner side of the boot was raised and an instep support ordered for a time. At the end of a month this patient could get about well, and in three months was normal again and could discard her supports. Had active treatment been adopted early the disability would probably not have lasted more than two or three weeks.

The bones, and most likely all other tissues, and at all stages of life to a varying extent, are in a state of flux, old bone being absorbed and new deposited. Immobilisation results in side-tracking the circulation and wasting of muscles, ligaments, soft tissues, and bones. It seems doubtful if under such conditions the products of tuberculous inflammation can be adequately removed even when resistance has been raised and the tubercle bacillus defeated; so fibrosis, rather than resolution, follows.

When heliotherapy first became fashionable I suggested that one of its advantages was that it would lead to less complete immobilisation of tuberculous joints. I now read in an article by Rollier, "Plaster was finally abandoned in favour of apparatus which provided sufficient immobility without interfering with the access of air and sun to the affected part." Kisch takes the joints off splints for passive movements at regular intervals.

No absolute rules can be laid down; ankylosis will sometimes result whatever is done, and plaster may be a most useful aid to recovery. (A tuberculous knee may do very well in plaster although the patient continues to walk on it.) But generally speaking *the immobilisation of a tuberculous joint should be relative and not absolute.* Such splints as the Thomas knee and hip-splints, and simple spinal supports, seem to give better functional results than absolute fixation, either in plaster or in accurately fitted celluloid splints. In the treatment of abscesses there will probably be no difference of opinion that aspiration, as practised at, say, Alton, gives much the best results. Perhaps there is now a tendency to rely more on simple aspiration and less to inject substances into the abscess cavity, which certainly increases the risk of a sinus. Time does not allow a detailed consideration of the treatment for each joint. Many points might be raised. For instance, is an extension-frame for spinal cases essential? Would not simple rest in bed be sufficient, especially if the patient were maintained in the supine position? (It may be remarked that the prone position is also useful.) Such splendidly managed and up-to-date institutions as Alton or Leasowe might give us some useful *controlled* observations on the point.

Short Cuts.

The question of short cuts in the treatment of tuberculous joints needs careful consideration. Three years or more has been laid down for the cure of a tuberculous hip, yet cases often abandon treatment voluntarily, or on the advice of some practitioner, and the result is functionally excellent. Now and again a relapse results, and it is the relapse, rather than the case that has neglected advice and got well, that comes to the notice of the specialist. But a relapse resuming strict treatment is often speedily quiescent again. Here are a few instances of short cuts:—

CASE 27.—Male, aged 6, with diagnosis of a tuberculous hip, confirmed definitely by X rays. He was three months in hospital, and then discharged with a Thomas hip-splint and patten. He discarded both these within six months, and has remained well since. Now, at 12, the joint in functionally perfect.

CASE 28.—Female, aged 15, had swelling and pain in the left knee at Christmas, 1915. It improved, but was again affected towards the end of 1916. She did housework intermittently and with difficulty. In June, 1917, she had to lie up, with night pains and the typical picture of a tuberculous knee. For nine months she wore a Thomas knee-splint, then discarded it and used the joint. There was no relapse. Now she is married and has one child, and the knee is functionally normal.

CASE 29.—Female, aged 22, suffered from pain in the back for some months, which occasionally kept her awake at night. There was a slight projection of the dorsilumbar spines and tenderness on percussion in this area with rigidity of the muscles. Pott's disease was diagnosed, the patient was put to bed and kept on her back. The pain gradually subsided and after six months, she got up and the spine has since remained normal (three years). She wears no apparatus other than a rather high pair of corsets.

CASE 30.—Female, aged 10, was treated for some months for tuberculous disease of the left knee. At 16 swelling of the right ankle occurred which burst and discharged for a short time. I saw her two years later because of a suspected recurrence of disease in the ankle. The right ankle was swollen and hot—1½ inches more in circumference than the left. Plaster was advised, but refused, and after resting a few weeks she recommenced work as a domestic servant and has worked continuously for four years, the ankle bandaged and occasionally painful, but functionally useful, though not perfect.

CASE 31.—Fisherman, aged 26, had pleurisy on the right side; and at 27 he had pleurisy on the left. There were signs of pulmonary tuberculosis of medium extent, and tubercle bacilli were present in the sputum. The patient was sent for three months to a sanatorium. Next the right knee became swollen, stiff, and painful, and seemed clearly tuberculous. A splint was advised, but refused, and the patient returned to sea, after resting a month or two. The right knee was normal 13 months after the onset, and remained so. Tuberculosis of a right costal cartilage then occurred, which burst and discharged for a few months. At 30 there was double "sciatica" and back pain with marked rigidity of the lumbar spine, but the patient continued at work, and after a few months this also cleared up. Unluckily at 32 a marked exacerbation of pulmonary disease took place, and he died at 33.

CASE 32.—Female, aged 18, had pain in the back, and her doctor diagnosed lumbar caries with an abscess. Another doctor was consulted who agreed with the diagnosis and opened the abscess in his surgery, liberating one and a half pints of pus. I saw her with a sinus and agreed that spinal tuberculosis was present. The sinus healed in a few months and she has remained well since (six years). She is now married and has one child.

CASE 33.—Farm labourer lost his wife from pulmonary tuberculosis when he was 44. At that time he began to suffer from severe lumbar pain and, although treated with liniment and medicine for two years, had great difficulty in continuing at work. At 46 the right shoulder swelled, and when seen by me there was tuberculosis of the lungs and of the right shoulder, with suppuration, as well as a *marked* Pott's curve in the upper lumbar region. The shoulder was operated upon, and is now ankylosed, but a sinus persists. The back has been painless for over a year.

CASE 34.—Female, aged 9, had pulmonary tuberculosis and was very ill. When seen there were rather extensive signs, the temperature was 101°, the pulse-rate 132, and the respiration 35. Gradually she improved, but at 10 there were pain and stiffness of the right hip, and subsequently a swelling appeared in the right buttock. She was in bed one month, then gradually began to move about again. Six months later the swelling had disappeared. At 11 (one year later) she could walk three miles a day. At 12 there was still a prominence noted in the right groin, and fullness of the veins. At 13 this had disappeared, and the patient has been normal since—2 years. She attended school regularly after two years' absence until the time came to leave.

It is impossible to be dogmatic when treating a disease of infinitely varying virulence attacking patients with widely different and ever varying resistance; but in the days to come it is likely that the reputation of a surgeon dealing with tuberculous joints will depend on his knowledge how and when to take short cuts. There seems to come a period during the treatment of tuberculous joints when the tide turns and the patient's resistance begins to defeat the bacillus. This is the time, when the enemy is "on the run," that movement may be commenced whether sinuses are present or not; but I hesitate to give any method for detecting this period.

Finally, I will cite a case of obstetrical as well as surgical interest.

CASE 35.—F. H. commenced treatment for tuberculous hips when a girl of 3. Disease of the spine developed about 5, and subsequently a lumbar abscess was incised. The disease became arrested in spine and hips, but the hips were left ankylosed in the adducted position, so that the internal condyles of the right and left femora were in contact and walking difficult and ungraceful. At 23 she married a

sailor, and at 27 became pregnant. It seemed unlikely that this child would be born alive without a Cæsarean section, as has been done in such cases, but after what the patient called a "terrible" time the child was born normally. The movement of the hips has improved, and the knees can now be separated over an inch and a half.

Summary.

1. A new classification for tuberculous joints is suggested.
2. Minor tuberculous arthritis is described.
3. Relative rather than absolute immobilisation for tuberculous joints is advised.
4. Short cuts in the treatment of tuberculous arthritis are discussed.

THORACIC SURGERY: WAR LESSONS IN CIVIL PRACTICE.

BY R. P. ROWLANDS, M.S. LOND., F.R.C.S. ENG.,
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THE surgery of the thorax has been greatly stimulated and advanced by the late war. The enormous number of casualties and the unexpected severity and mortality of thoracic wounds inflicted by shells and bombs gave an enthusiastic band of workers (prominent among whom were Gask[1] and Duval) wonderful opportunities of acquiring accurate knowledge of the pathological results of these wounds, of improving our methods of saving life, and of preventing prolonged invalidism from later complications. These keen and devoted workers were able to establish military thoracic surgery on the sound foundation of accurate knowledge. They soon learnt that the dangers of general collapse from unilateral pneumothorax and of hæmorrhage from the lung had been greatly exaggerated, and also that the disastrous effects of sepsis could be very largely avoided by operating as early as possible—always within 24 hours—cleaning out the pleura and excising the damaged and infected wounds of the chest wall, pleura, and lung. Above all, they learnt the need and value of closing the parietal wound in layers, to prevent secondary infection, and of completely restoring the function of the lung by the abolition, without delay, of the pneumothorax. The terrors of chronic empyema are thus avoided. The prevalent belief that the costly pressure-chamber or the intratracheal insufflation anæsthesia was necessary for safe work in the major thoracic surgery was shown to be without foundation. Operations which had to be undertaken without these supposed advantages proved that the pleura could be freely opened without causing serious collapse.

The operations here described are: (1) The removal of an extensive sarcoma of the chest wall; (2) the removal of a large hydatid cyst from the lung; and (3) the thoracic treatment of diaphragmatic hernia.

Sarcoma of the Chest Wall.

CASE 1.—Female, married, aged 48, was sent for operation by Dr. T. H. Davison of Odiham, in February, 1921. A swelling had appeared over the lower right ribs some 15 months before. It was then thought to be a lipoma, and the patient did not appear again for more than a year, when the swelling had greatly enlarged and had become fixed. When I saw her the growth was 5 inches long and 4 inches broad, and inseparable from the lower ribs.

Operation.—Ethyl chloride, warm ether, and oxygen were administered through an ordinary facial mask and a large elliptical mass of the whole thickness of the chest wall (including the tumour) was excised, thus making a very large opening into the right pleura. There was little, if any, shock. The whole of the right lung, which had partially collapsed, could be seen and examined, and the dome of the diaphragm, the wall of the pericardium, and the descending aorta were very evident. All bleeding having been arrested and the pleural cavity cleared of clots, the thoracic wall was closed in layers, pleura to pleura, muscle to muscle, and skin to skin. This was easier than was expected, for there was little tension upon the stitches. The patient did well, the wound healing primarily and the pneumothorax rapidly absorbing; there was no pleurisy or fever. The patient was able to travel home ten days later and has remained well ever since.

The growth was a slow-growing, spindle-celled sarcoma. It is too early to date to venture any opinion on the ultimate prognosis, but the case shows that a large part of the chest wall, including the pleura, can be removed without any undue risk, provided the latter can be satisfactorily closed at once.

Hydatid of Liver and Secondary Hydatid of Lung.

CASE 2.—Female, unmarried, aged 26, was hit in the epigastrium by a hockey stick in 1913. Severe pain, rigidity, and collapse ensued and a ruptured viscus was feared, but gradual recovery followed. In 1914 an extraordinarily loud rub was sometimes heard over the base of the right lung. The patient could hear it herself and so could anyone standing near her. In 1916 her health was poor; there was slight hæmoptysis, fever, and dullness over the right base. Tuberculosis was feared, but X ray examination by the late Dr. Ironside Bruce revealed a large spherical opacity above the right lobe of the liver, below the diaphragm, and the heart was displaced to the left. There was no opacity to suggest involvement of either lung. There was a rub over the swelling and a leucocytosis of 12,000. In August, 1916, another radiogram showed that the cavity below the diaphragm contained air and liquid, and an operation was advised for draining the collection which was supposed to be a suppurating hydatid. (See diagram.)

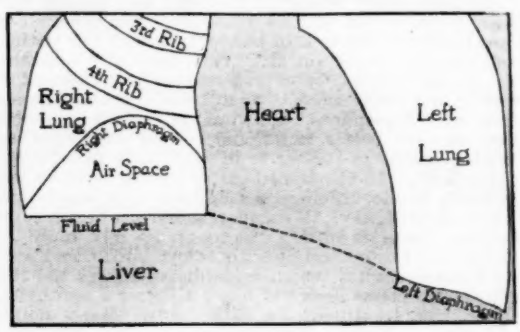

Diagram of Case 2.

Operation (August, 1916).—A needle was inserted just above the tenth rib in the line of the posterior scapula and passed into the cavity. It withdrew air and a clear watery liquid, which was shown by Dr. G. W. Nicholson to contain a large number of active hydatid embryos. Parts of the tenth and eleventh ribs and their cartilages were then removed below the pleura; the diaphragm was incised and a cyst, the size of a cocoanut, was seen projecting from the upper surface of the liver, high up and far back. This cyst was opened and was found to contain a very large number of other cysts of different sizes. They were removed and the cavity cleaned out and drained. Bile escaped for some weeks, but the patient made a good recovery.

In the summer of 1918, however, a large hydatid cyst had to be removed from the lower lobe of the right lung. Ether and oxygen were given in the ordinary way and the right pleura was opened freely, without any bad result. A hydatid cyst, the size of a large cocoanut, was shelled out and the cavity thus left was drained, for one of the bronchial tubes was opened and could not be closed. The patient made a good but slow recovery, the wound finally closing six months later. She has now remained quite well for four years, and in March, 1921, gave birth to a healthy child.

In the light of our present knowledge it is clear that the cavity in the lung could have been obliterated, the open bronchus closed, and the parietal wound sewn up completely, without drainage, with great advantage to the patient.

Diaphragmatic Hernia.

CASE 3.—A male, aged 19, was admitted to Guy's Hospital in October, 1920. Seven or eight months previously he began to have pain, sometimes accompanied by vomiting, about an hour after meals. The pain used to be considerably relieved when in the recumbent position, but only when lying on the left side. Lately the period between meals and the onset of pain had become lessened, and when I saw him he was experiencing pain directly after meals. If the

[1] Gask, G. E.: Trans. Med. Soc. Lond., 1921, xliv., 179.

pain is not allayed he induces vomiting. There was much flatulence; no hæmatemesis; bowels regular; no respiratory distress at any time. About six months ago he was operated on elsewhere for supposed gastric ulcer. The stomach was found fixed high up in the epigastrium. The condition was not diagnosed and the abdomen was closed without further interference. Three weeks after the operation the pains became the same as before; they were in the epigastric and umbilical regions.

Condition on Admission.—The patient was very thin and anæmic. P. 60. Temp. 96·8° F. Respiration 20. Abdomen: Definite sinking-in of epigastrium; abdomen moves well. No tenderness; no abnormality on palpation. Thorax: Lower ribs unduly prominent on left side in front and limited above by a sulcus running transversely (like a unilateral Harrison's sulcus). Patient had noticed this for the last six months. Chest otherwise looks normal. Heart: Apex one inch inside nipple line. No dullness to right of sternum. Sounds normal. Lungs: Percussion. Normal resonance over both sides except below scapula on left side, where note is tympanitic. Air enters all over both sides but voice sounds weak at left base. No borborygmi or metallic tinkling heard in chest.

X Ray Report.—First hour: The œsophagus passes down to the level of the lower border eleventh dorsal vertebra, and then turns to the left to join the stomach. The whole of the stomach lies above the diaphragm—the fundus behind and the pylorus antero-internally. The œsophagus enters the fundus at its lowest part. The motility of the stomach is good, and the meal leaves normally, but the duodenum does not appear to follow its normal course; none of the small gut appears to be above the diaphragm. Some of the opaque meal given on the previous day now seen in the splenic flexure above the diaphragm. Fifth hour: Stomach empty, meal in small intestine. Seventh hour: Meal in small intestine, none in cæcum. Thirtieth hour: Meal occupies large gut from cæcum to pelvic colon.

Operation.—Intra-tracheal ether, patient lying on the right side. An eight-inch incision made over eighth left rib, which was removed sub-periosteally and the chest opened, displaying a large serous cavity occupying the lower two-thirds of the left chest. Through the upper thin wall of this cavity the base of the lung could be seen, but it was not in the cavity. There was no distress on opening the latter, but it contained the whole of the stomach, the splenic flexure of the colon, and the spleen. There were some adhesions between the stomach, the great omentum, and the wall of the cavity, and especially between the spleen and the colon, and the back and left side of the cavity and the edge of the opening in the diaphragm. The stomach was rough, red, and bruised on the surface near the pylorus from friction against the front and inner edge of the opening. This was four inches long and one inch wide and was placed near the back of the diaphragm, extending downwards and outwards to the chest wall from near the œsophageal opening of the diaphragm. Its edges were thick and smooth. The anterior edge was much more definite than the posterior. The opening was clearly congenital and consisted of a slit between the lumbar and costal fibres. After separating the adhesions and tying many of them the viscera were returned into the abdomen and the opening in the diaphragm closed with many catgut sutures. The parietal opening was then completely closed without a tube. The patient was somewhat shocked after the operation, but revived after saline enemata. Pulse never went above 120. The wound healed well and he got up and walked about 14 days later. He improved greatly in health and put on weight. His symptoms were completely relieved.

X Ray Examination.—Report 18 days after operation: There is a large opacity at the base of the left lung which is probably caused by pleural thickening (? blood clot) in old hernial sac; the opaque fluid passes freely through the œsophagus and into the stomach, which is lying in normal position in the abdomen and shows no abnormality. Report 37 days after operation: Radiogram shows a marked diminution of the opacity in the left chest, indicating that the lung is expanding quickly; pictures were taken before opaque meal—i.e., there is no question of the thoracic opacities being due to bismuth.

These three cases illustrate the value in civil practice of lessons learnt in the hard school of war.

JENNY LIND HOSPITAL FOR CHILDREN, NORWICH.

The vacancies on the surgical staff caused by the death of Mr. H. Whitwell and the resignation of Mr. T. J. Wright have been filled by the advancement to full surgeoncy of Mr. W. Watson and Mr. T. W. Hancock, and the appointment as assistant surgeons of Mr. G. S. B. Long and Mr. Philip Murphy. Dr. B. B. Morgan has been appointed honorary anæsthetist. Plans for a small casualty department are under consideration as well as the appointment of a second resident medical officer.

ON THE IDENTITY OF THE TOXINS PRODUCED BY SEROLOGICALLY DIFFERENT STRAINS OF *BACILLUS DIPHTHERIÆ*.

BY PERCIVAL HARTLEY, *M.C.*, D.SC. LOND.

(*From the Wellcome Physiological Research Laboratories.*)

HAVENS (1920) examined 206 strains of the diphtheria bacillus by means of a monovalent agglutinating serum and found that 169 strains (82 per cent.) were agglutinated by it in a dilution of 1/4860, and the strain used for the production of this serum was also agglutinated at this dilution. Thirty-seven strains (18 per cent.) failed to agglutinate. Accordingly a member of this smaller group was used for the production of a second agglutinating serum and it was found that all the members of this second group were agglutinated by this serum in a dilution of 1/4860. No evidence of cross agglutination was obtained; the two sera were specific for their respective groups. Havens also found that whereas the toxins produced by members of group 1 were neutralised by the antitoxin in common use (which is usually made from strain Park Williams No. 8 belonging to group 1) the toxins produced by the members of group 2 required very large amounts of antitoxin for their neutralisation. As a rule 20 units of standard antitoxin protected against one minimum lethal dose of group 2 toxin, while 5 to 10 units regularly failed to protect. Some samples of antitoxin, however, required to be used in much larger doses in order to neutralise one minimum lethal dose of group 2 toxin; in two cases 100 units were necessary, and in a third case even 1000 units failed to protect. Havens concluded from his experiments that standard antitoxin contains group antitoxin which protects against the toxins from both strains of the diphtheria bacillus, and that the amount of this group antitoxin, though never very large, varies in different samples.

Havens draws conclusions from his work which have a very important bearing on the preparation of diphtheria antitoxin and its practical use. He suggests that those cases which do not yield to treatment except by the use of very large amounts of antitoxin may be due to infection by organisms belonging to group 2. He also points out that, in spite of the increasing use of antitoxin and its administration early in the disease, the death-rate from diphtheria in America is still about 10 per cent., and this again may be due to infection by organisms belonging to group 2. Other procedures which, according to Havens, are affected by his results are the Schick test and active immunisation by toxin-antitoxin mixtures. As practical measures Havens recommends the inclusion of toxin from a member of group 2 in the routine preparation of antitoxin, the use of a mixture of toxins of both groups for the Schick test, and the use of mixed toxins and antitoxins for active immunisation.

Further Experiments.

Paxson and Redowitz (1922) repeated Havens's experiments and confirmed his results in so far as the occurrence of two serologically different groups of diphtheria bacilli are concerned. They were unable to obtain any evidence that the toxins from group 2 were not neutralised by standard antitoxin, and they concluded that antitoxin prepared from toxin obtained from group 1 strains neutralised equally well the toxins belonging to either group.

Park, Williams, and Mann (1922) examined five strains received from Durand (1920) who had shown by agglutination and absorption tests that they belonged to five different groups. Four strains belonging to Havens's group 2 were also examined. These workers fully corroborated Durand's results, and found that the four Havens's strains were not agglutinated by their type 1 serum, and they conclude

"that in all communities there are many types and at least several dominant ones." They found, however, that the common antitoxin protected against living cultures of organisms belonging to five different groups, including three of Havens's group 2 strains and, further, that toxins prepared from members of all five groups were neutralised by the usual amounts of antitoxin.

The question of the identity of the toxin from different strains of the diphtheria bacillus and the efficacy of antitoxin arises from time to time in this country. It was stated in a recent report of the medical officer of health of one of our large cities that larger doses of antitoxin are required to-day to produce the same clinical improvement than were needed seven years ago, and it was suggested that this may be due to an alteration in the type or toxicity of the prevailing bacillus. A. S. G. Bell (1922), working at the Royal Army Medical College, investigated 130 strains of *B. diphtheriæ*, over 90 per cent. of which were isolated from swabs taken in the London area during a recent epidemic. An agglutinating serum prepared from strain Park Williams No. 8 agglutinated 17 (13 per cent.) of the strains. A second serum, made from a strain not agglutinated by the type 1 serum, agglutinated eight strains (6 per cent.), while a third serum, made from a strain which was not agglutinated by either type 1 or type 2 serum, agglutinated 80 strains (61 per cent.). Twenty-five strains (20 per cent.) were not agglutinated by either of the three sera prepared.

At Major Bell's request I undertook the study of the toxins produced by members of these three groups. The main object of the inquiry was to ascertain whether the toxins were neutralised by the antitoxin in common use which is made from the toxin produced by the Park Williams No. 8 strain.

Method of Present Test.

Fifteen strains, received at different times, were investigated. They were sown on 100 c.cm. quantities of the medium used in these laboratories for toxin production (1922, Hartley, P., and Hartley, O. M.) and after incubation at 37° C. for three days 0·5 per cent. of pure carbolic acid was added. The sterilised cultures were allowed to stand overnight in the dark and then filtered. Preliminary tests on the toxin were carried out by the intracutaneous method (Römer and Sames (1909); Glenny and Allen (1921)), the results of which showed that three of the strains had produced practically no toxin, that 12 had produced toxin in very variable amounts, and that all the toxins, irrespective of the group to which the strain belonged, were neutralised by the antitoxin in common use.

The results obtained by the intracutaneous method of testing indicated that eight of the toxins were of sufficient potency to admit of more complete examination by tests on the whole animal. Accordingly, the minimum lethal dose (M.L.D.), the dose which neutralised exactly one unit of antitoxin (Lo dose), and the dose which, when mixed with one unit of antitoxin, caused the death of the animal in 4–5 days (L+ dose) were determined in order to ascertain whether any toxin exhibited any unusual feature, and particularly whether the toxins from strains belonging to group 2 or group 3 required abnormally large amounts of antitoxin for their neutralisation.

The results of these experiments are summarised in the following table.

Seven of these toxins, although varying widely in potency, are very similar in composition, and the eighth (from strain "Swindon") differs from the others only in so far as the proportion of toxoid is somewhat less. There is no evidence that any strain produces a toxin which requires more than the usual amount of antitoxin for neutralisation. Post-mortem examinations were carried out on all the animals which died and all showed lesions typical of diphtheria poisoning.

The three strains "Swindon," "Phillips," and "Evans," when grown on liquid medium, exhibited several interesting features. These strains all belong to group 3—the largest of Bell's groups. Recently isolated strains of *B. diphtheriæ* usually produce toxin of relatively low potency. Theobald Smith and Walker (1896) studied the toxins produced by 42 different strains and found that the minimum lethal dose varied from 0·036 c.cm. to 0·12 c.cm. G. Dean (1913) states that the minimum lethal dose of toxins from recently isolated strains ranges from 0·1 c.cm. to 0·02 c.cm. and that on rare occasions the dose may reach 0·01 c.cm. The minimum lethal dose of the strains "Swindon," "Phillips," and "Evans" was

Tests of Toxin from Different Strains of B. diphtheriæ.

Strain.	Type.	M.L.D. in c.cm.	L+ dose. c.cm.	Lo dose. c.cm.	No. of M.L.D.'s neutralised by 1 unit of antitoxin.
79 I.	1	0·014	0·75	0·65	46
88	1	0·012	0·65	0·55	46
79 II.	1	0·045	2·90	2·25	50
Black.	2	0·05	2·30	1·80	36
Lister VII.	2	0·025	1·20	1·00	40
Swindon.	3	0·006	0·68	0·55	91
Phillips.	3	0·007	0·36	0·30	43
Evans.	3	0·009	0·48	0·38	42

0·006 c.cm., 0·007 c.cm., and 0·009 c.cm. respectively. These three strains were also exceptional in so far as they all grew readily as surface films, and not throughout the medium, and they all grew very rapidly. It was possible to compare them under similar experimental conditions with strain Park Williams No. 8, the behaviour of which on the medium used was well known. This strain produces a complete film in 20 to 24 hours, but under the same conditions strains "Swindon," "Phillips," and "Evans" produced a film of equal density in 12 to 14 hours. The film produced by strain Park Williams No. 8 remained on the surface almost indefinitely, while the film produced by these three strains frequently sank to the bottom of the vessel after 18 to 24 hours' incubation, and shortly afterwards a second film began to grow. It is unfortunate that more strains were not investigated, as it would have been interesting to see whether rapid growth and the production of relatively large amounts of toxin were characteristics common to all members of this particular group of diphtheria bacilli.

Results Obtained.

The results are in agreement with those obtained by Paxson and Redowitz and by Park, Williams, and Mann. Further, these results obtained experimentally in the laboratory are in accord with the vast amount of clinical evidence concerning the efficacy of monovalent diphtheria antitoxin which has been accumulated during the last 25 years all over the world. It is reasonable to suppose that if different strains of diphtheria bacilli produced toxins which exhibited wide differences in their affinity for antitoxin, evidence—or at least indications—of this would have been forthcoming from workers studying diphtheria from the clinical side. As Park, Williams, and Mann point out, ever since diphtheria antitoxin has been used in practice hundreds of thousands of persons known to be contacts have been given practically complete protection for two weeks by the injection of monovalent antitoxin; and, further, routine virulence tests throughout the world have shown that a monovalent antitoxin protects animals against a dose of living culture fatal to others not given antitoxin.

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VON WAGNER'S NEW TREATMENT OF GENERAL PARALYSIS.

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IN many previous publications I have pointed out the results obtained by v. Wagner's treatment of general paralysis—i.e., the combination of artificial fever with a specific cure (mercury, &c.); at the International Congress of Ghent, in 1913, I came to the conclusion that the use of this method leads to remissions of (1) much greater frequency, (2) a much higher degree, (3) much longer duration than in the spontaneous remissions—i.e., in cases not treated. Although our results have been confirmed by the observations of other authors (Battistessa, Tamburini, Hudovernig, Glouschkoff, Myiake, Meyer, &c.), Wagner's tuberculin-mercury method seemed to require a correction. Patients who practically recovered—i.e., improved so much that they were able to devote themselves to their former occupations—often relapsed after a short time; in many cases, however, the remission persisted for from seven to eight years. After comparing the various methods of bringing about artificial fever, and thoroughly examining the cases of so-called "spontaneous remission," v. Wagner has drawn up a scale of efficiency as follows: (1) chemical substances (e.g., sodium nucleinate); (2) toxal-bumins (tuberculin, typhus vaccine, staphylococcus, &c.): and (3) acute disease itself. Remissions in the course of, or after, an acute febrile attack being the most permanent and most intense, v. Wagner studied the possibility of provoking such an attack in order to facilitate a quick and certain cure.

Technique.

Von Wagner's new treatment of general paralysis is as follows: A patient is selected who suffers from tertian malaria (but not from tropical malaria), and who has not been treated by quinine (in order to avoid quinine-fast stems of plasmodies). During an attack of fever 2 c.cm. of blood are taken from the patient by venous puncture, and injected underneath the skin of the paralytic patient's back. After from one to two weeks, on an average, the first attack takes place, accompanied by shivering; the temperature rises to 40° C. and over. After some 10 or 12 attacks the malaria is checked by quinine during the first three to four days (0·5 g. quinine sulphate twice a day for three or four days, and then once daily for two weeks); at the same time a course of neosalvarsan is begun (intravenous injections once a week, commencing with 0·3 g., and working up to 0·6 g.). During the malarial attacks acoustic hallucinations, ideas of persecution, delirious and catatonic states are occasionally noticed, but all these symptoms will cease when the quinine cure is started.

Results.

Of 141 paretic patients, treated in 1919–20, 51 have completely recovered; 18 showed marked and persisting remission without being able, however, to return to their former occupations; 57 cases became stationary or showed an incomplete remission; 15 patients died. Omitting further details, for which I refer the reader to the publications of von Wagner and Gerstmann, I should like to mention that there is no parallelism in the degree and duration of the remissions on the one hand, and in the serological reactions (lumbar fluid, &c.) on the other. The best results are given by cases with the maniacal affections and by those of simple demency; the hypochondriacal, presenile, and catatonic forms of disease show a less favourable prognosis. Generally remission does not immediately follow treatment; it develops gradually, finally becoming permanent. I may add that this method is employed, not only in cases of general paralysis, but also in tabes and other forms of neuro-syphilis; in disseminated sclerosis, also, good results have been obtained.

I hope that this brief note will be of interest to readers of THE LANCET—especially to general practitioners—who observe the paralytic patient in his early stage, and have, therefore, better chances of giving help than the alienist who generally has to deal with further advanced cases.

To emphasise the favourable influence of fever upon the paralytic process, I would call attention to two very interesting facts. Investigating the final histories of about 5000 soldiers who acquired syphilis in 1880–90, Mattauschek and I found 5 per cent. of paralytics. Of patients who had suffered from erysipelas, malaria, or other feverish diseases during the first year or two years after their primary sclerosis not one became paralytic; none of the patients who later became paralytic had such a feverish disease in his anamnesis. Further, we know the great differences of frequency of general paralysis and its dependence on race and climate; in the tropics the disease is proportionately much less frequent, although syphilis is there almost endemic. Perhaps this fact is connected with the endemic frequency of malaria, yellow fever, &c., among peoples dwelling in tropical countries. Perhaps, also, we may here find a hint as to the possible prophylaxis of general paralysis—treatment of the syphilitic patient not only by arsphenamin, &c., but also by artificial fever. In other words, von Wagner's treatment should be applied not only when general paralysis is already manifest, but also much earlier, in any case of secondary syphilis.

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THE BACTERIOLOGY OF OZÆNA.

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THE ætiology of ozæna has interested a number of workers in Europe and America, and a fairly extensive literature exists upon this subject. Up till now, however, opinions remain divided and no agreement has been reached. Recently very few bacteriologists seem to have taken an interest in this question, but it continues to be a live problem for the oto-rhino-laryngologists. To me it seems imperatively to require the coöperation of the bacteriologist, and I have engaged in research in this direction for several years. I succeeded in isolating various bacteria from the discharge from the nasal passage, and studied them carefully in regard to questions of biology, immunity, &c., in order to find out which of them might be a special factor in the ætiology of the disease. I came to the conclusion that there is some prospect of settling the question definitely, and, as I am fully convinced that bacteriology will some day contribute its share to the treatment of the disease, I give below an outline of the results of my studies, soliciting the criticism of my professional colleagues.

Results of Experiments.

The results of the various experiments may be summarised as follows:—

1. Among the seven different kinds of bacteria obtained from the nasal passages of ozæna patients, the most numerous were Gram-negative bacilli, occurring either above or in company with others;

less frequent are staphylococci, Gram-positive bacilli, and catarrhal micrococci; the others occurred in small numbers only. For convenience of identification I numbered the different kinds, calling those with the highest frequency No. 1 bacteria, those with the next highest frequency No. 2, and so on down to No. 7.

2. From my experiments regarding virulence, infection to animals, and immune reaction of the above, No. 1 bacteria appear to be by far the most potent; I have therefore devoted myself chiefly to the study of No. 1, and mention results obtained in respect of the others only for purposes of comparison.

3. As No. 1 type possesses the highest pathogenicity, I consider it to be the pathogenic bacteria of ozæna. It resembles fairly the coccobacillus described by Perez and Hofer, and I regard it as belonging to that genus.

4. Among the Gram-negative bacilli I observed Friedländer's bacillus and one closely resembling Abel's bacillus, the latter occurring in extremely small numbers. Most bacteriologists recognise three kinds of capsulated bacteria, with different degrees of mucus-production—viz., Friedländer's, rhinoscleroma, and ozæna bacilli, which, however, are only differentiated with difficulty. I myself have not been able to obtain any forms referable to the *Bacillus rhino-scleromatis*, but I think the so-called ozæna bacillus is very nearly allied to Friedländer's, although the two are not absolutely identical. There are, further, Abel's and Perez's bacilli, very similar in many points and disagreeing in others. It seems to me that all these bacilli represent one species, which, however, is separated into distinct races according to their origin. Among the coccobacilli obtained there is one closely resembling that mentioned by Abel. Among the No. 2 bacteria (Gram-positive bacilli) some are mucus-producing, some non-mucus-producing. The former, as far as immune reaction is concerned, have many points in common with the coccobacilli, which, however, are Gram-negative and quite dissimilar in respects other than immune reaction. The non-mucus-producing bacilli in certain respects resemble pseudo-diphtheria bacilli.

5. Among the coccobacilli it is possible to isolate two strains growing on milk, and four growing on sugar. As I am still continuing my experiments in this direction I reserve fuller details for later publication.

6. The virulence of the coccobacilli is of medium degree in mice, and weak in white rats, guinea-pigs, and rabbits. The virulence is not weakened by repeated passage through the same species of experimental animal.

7. In my animal experiments relating to infection with coccobacillus I was successful in reproducing the symptoms arising during ozæna in the human body—viz., stinking snivelly secretion, ulcerations on the outside of nasal ala and lower jaw, and abnormal formation of crusts.

8. My immunisation experiments with serum from ozæna patients and experimental animals show the following results:—

(i) *Bacteriolysis.*—(*a*) The serum from an ozæna patient is feebly bacteriolytic against coccobacillus, or quite inactive; (*b*) The bacteriolytic action of the blood serum of an immunised rabbit is weak against coccobacillus; it makes apparently no difference whether mucus-producing or non-mucus-producing bacilli have been used as antigens, and therefore, from a practical standpoint, either may serve as antigen.

(ii) *Phagocytosis.*—The blood serum from an immune rabbit or a healthy person shows a high opsonic index with the non-mucus-producing bacilli, but a low one with mucus-producing coccobacilli.

(iii) *Agglutination Tests.*—(*a*) The serum of ozæna patients shows a comparatively weak positive reaction against coccobacilli obtained from the same person; some sera, however, exhibit a notable action against other bacteria; (*b*) the rise in agglutinating power of the serum obtained from an ozæna patient after vaccine treatment, compared with that from the same patient before treatment, is quite remarkable, although the agglutinating power of a patient's serum never comes up to that exhibited by serum from an immune rabbit; (*c*) the serum derived from an immune rabbit shows a powerful agglutinating action against the coccobacillus; (*d*) the serum of a rabbit immunised with coccobacillus accompanied by mucus-producing and non-mucus-producing bacilli agglutinates remarkably well both the mucus-producing and the non-mucus-producing bacilli; (*e*) in experiments conducted by myself in analogy to Babes's agglutination test the serum of a coccobacillus-immune rabbit produced agglutination in a notable degree with coccobacillis, but not with Gram-positive or Friedländer's bacilli.

(iv) *Complement-fixation Tests.*—(*a*) The serum from an ozæna patient (before treatment) shows only in rare cases a noticeable positive reaction against coccobacilli obtained from the same patient, and it shows likewise a weak positive reaction against other bacteria; (*b*) the complement fixation of the serum from a patient after vaccine treatment never rises to that of the serum from an immune rabbit; on the contrary, the reaction remains in most cases either very weak or absolutely negative, though in a very few exceptional cases a strongly pronounced reaction was quite unexpectedly observed; (*c*) the complement-fixation reaction of the serum from an immune rabbit is positive in a remarkably high degree; (*d*) there is a great deal of mucous matter attached to coccobacillus colonies growing in culture-media, and this mucus can be removed by washing the colonies with salt water; if we use separately the washed colonies and the mucus-containing washing fluid for immunisation, and compare the sera obtained by their help with each other, as well as with serum obtained by help of unwashed colonies, we find as follows: With serum obtained by means of merely the washing fluid the complement-fixation reaction is positive, though weaker than is the case with serum obtained by means of washed colonies, and the use of unwashed colonies brings about a stronger reaction than that of washed colonies. It seems, therefore, that the presence of this particular mucus, far from impairing the production of immune bodies, has in fact a favourable effect.

(v) *Precipitin Test.*—The serum from a coccobacillus-immune rabbit shows positive reaction in a moderate degree.

(vi) Whereas the serum from an immunised rabbit is strongly positive against coccobacillus in both the agglutination and complement-fixation tests, the serum from an ozæna patient shows rarely a strong, generally a weak, reaction. Ozæna seems to be a purely local affection, and consequently the antibodies in the blood are produced in small quantities only. To make this still clearer, let us once more return to the animal-infection experiments: In rabbits that after infection with coccobacillus had shown marked pathological changes at first, but were manifestly on their way towards recovery, both agglutinating and complement-binding power of the serum were found to have risen to a high degree. But in other cases, where the pathological changes were limited to a small area or altogether absent, no positive reaction was shown at all. In other words, there is no immune reaction in cases where the pathological changes are slight or locally restricted; but if the initial pathological changes go beyond a certain degree, the serum shows during subsequent recovery the same strong positive reaction as that exhibited by serum from an immunised rabbit. By analogy it is easily seen why the serum of the great majority of ozæna patients shows at most a weak immune reaction.

Conclusion.

The results of my experiments may be briefly recapitulated as follows:—

1. The so-called ozæna-bacillus, obtained from the nasal passages of ozæna patients, agrees in all important points with the coccobacillus of Perez.

2. The coccobacillus is to be found only in ozæna patients, and not in persons suffering from other nasal diseases and healthy persons.

3. By experimental infection of the nasal passages of rabbits I was able to produce symptoms closely agreeing with those of human ozæna.

4. In the various immune tests with my coccobacillus the serum of ozæna patients generally showed a weak reaction; with some patients, however (i.e., those tending towards recovery), the specific reactions were remarkably strong.

5. It could be demonstrated that the serum from a rabbit immunised against my coccobacillus produces various immune bodies with great intensity.

6. In animal experiments with this bacillus the presence of immune bodies in the serum was clearly demonstrable; on the other hand, the reactions of the serum of most patients were rather weak. This can be explained from the nature of the disease, which causes merely local changes, so that in the general circulation the antibodies appear only in small quantities.

7. From the experiments relating to animal infection and immune reaction it appears that my coccobacillus may confidently be considered to be the causative agent of ozæna.

A CASE OF

PRIMARY CARCINOMA OF THE LUNG.

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PRIMARY malignant neoplasms of the lung are by no means common. The case here recorded presents certain features of interest.

History.—The patient, a man aged 50, was admitted to Craiglockhart Hospital, Edinburgh, on Jan. 28th, 1922, complaining of pain in the stomach and swellings on the body. He had always been healthy, except for an attack of pneumonia, probably lobar, many years before. The present illness came on insidiously at the beginning of 1921—the first symptoms being languor, an occasional headache, and intermittent attacks of diarrhœa. In September, 1921, he first experienced acute abdominal pain, which was accompanied by vomiting immediately after food; about the same time he developed an irritating cough with much expectoration, and lost weight rapidly. He recovered somewhat, but continued to be confined to bed until admission. There was no family history of tuberculosis or malignant disease. The patient stated that he smoked and drank to excess.

Condition on Admission.—He looked ill, flushed, and emaciated; he was experiencing continuous, though not severe, pain in the epigastrium, right hypochondrium, and lumbar regions. Three subcutaneous swellings, varying in size from a pea to a hen's egg, were present—one on the anterior fold of the left axilla, one on the seventh right costal cartilage, and one mid-way between the umbilicus and xiphisternum; these tumours were not attached to the skin, were firm in consistence, and only slightly tender. Later, a fourth swelling appeared on the flexor aspect of the right forearm. They continued to increase slowly in size, with the exception of the neoplasm associated with the pectoralis major, which before death attained the size of a small melon. There was no fungation. A small portion, excised from the forearm, was examined histologically by the courtesy of the Royal College of Physicians, and reported upon as follows:—"Shows the structure of a squamous epithelioma, very rapidly proliferative. (The primary growth, if not in the skin, must be in a mucous membrane lined by squamous epithelium.)" A similar report was given on a fragment of tumour obtained from the anterior aspect of the abdomen. A careful search of the skin and of the junction of the skin with mucous surfaces for any primary tumour, ulcer, or cicatrix, was made, but the result was negative. Patient vomited occasionally after food. There was no œsophageal obstruction. Analysis of a test-meal showed the presence of hydrochloric acid, though in slightly diminished quantity; no blood was present. He suffered from diarrhœa occasionally. There was nothing to note on rectal examination. Albumin (no casts) and blood were present in the urine for a short period after he came under observation. Examination of blood showed R.B.C., 1,850,000; Hb., 25 per cent.; W.B.C., 14,000. The systolic blood pressure was 100 mm., and the diastolic 65 mm. of mercury.

Course of Case.—For the first six weeks after admission night sweats were troublesome, and during the same period the temperature was intermittent, with evening rises varying from 99° to 101° F. The sputum was moderate in quantity, muco-purulent, and at times nummular; it was examined frequently—no tumour fragments were seen, but on one occasion tubercle bacilli were found. During this period he had two hæmoptyses, such as one associates with pulmonary tuberculosis. Physical examination of the chest revealed definite disease of the right pleura and lung—retraction above and below the clavicle, impairment of movement of right side of chest, and dullness on percussion, increasing in intensity downwards from the level of the second thoracic spine, with vocal resonance and breath sounds decreased over the same area. A few moist sounds were heard at the right apex. There was no evidence of cavity formation. The right base was explored on several occasions, but no fluid was obtained.

From the beginning of March until his death on June 8th, 1922, although there was marked abatement of the symptoms referable to pulmonary tuberculosis—e.g., cough, spit, and night sweats—the temperature remained subnormal, the area of dullness on the right side of the thorax slowly increased in size and intensity, and his condition became more typical of the cachexia of cancer. It was considered that the neoplasm might have its primary site in the right lung, but having regard to the pathological reports on the metastases, such a conclusion remained a matter of conjecture until the post-mortem inspection.

Post-mortem Examination.

There was a considerable degree of emaciation. A small subcutaneous swelling, about the size of a cherry, was present in the epigastric region, 3 inches below the xiphisternum and 1 inch to the left of the middle line. A second subcutaneous swelling, the size of a large orange, was present over the anterior aspect of the left pectoral muscles, 2 inches above the left nipple. A third swelling was embedded in the flexor muscles of the right forearm, 3 inches below the right elbow. On section all these swellings were of firm consistence, white, with scattered areas of a deep yellow colour. They occupied the cutis vera and subcutaneous tissue.

Thorax.—There were recent pleuritic adhesions on the left side. The left lung was very deeply pigmented with carbon, but there was no evidence of tubercle. It showed evidence of emphysema, congestion, and bronchitis. The lymphatic glands at the root were enlarged and pigmented. The right lung was firmly adherent to the parietal pleura, and could only be separated from the chest wall with considerable difficulty. On section of the organ there was seen a large whitish mass about the size of a cricket ball extending from the root outwards into the lung tissue. The remainder of the lung was congested and œdematous. The lymphatic glands at the root were enlarged and pigmented with carbon. The pericardial sac contained about 20 c.cm. of clear straw-coloured fluid. The heart was small; the subepicardial fat showed some myxomatous changes, while the coronary vessels were very tortuous and thickened. The valves of the heart were quite healthy. There was slight arterio-sclerosis in the aorta.

Abdomen.—A small white nodule of tumour growth was present in the right rectus abdominis muscle. There was no increase of peritoneal fluid. The liver was not enlarged, but showed some congestion. The spleen was slightly enlarged and deep red on section. The œsophagus, stomach, and intestines were normal. The mesenteric glands were enlarged, matted together, and whitish on section. The right kidney was normal in size, pale on section; there was a small white nodule, the size of a hazel-nut, in the cortex. The left kidney was normal in size; attached to its lower pole was a white lump of neoplastic tissue about the size of a walnut. The right adrenal was nearly three times the normal size; it was not adherent to the kidney; on section there was only a narrow rim of cortical tissue left, the rest of the gland being replaced by a homogeneous white mass. The left adrenal was also enlarged, and contained two small white nodules similar to that in the right adrenal. The pancreas contained a small white nodule at the junction of the head and body of the organ. The thyroid, parathyroids, testicles, bladder, seminal vesicles, prostate, and bones were all normal.

Microscopical Examination.—The primary lung tumour was composed of cylindrical columnar cells, arranged for the most part in papillary-like tufts. Much of the tumour had undergone a myxomatous type of degeneration. No evidence of a tuberculous process could be detected in either lung. A columnar type of cell was found in the pancreatic metastasis. In the adrenals, however, the cells showed more irregularity in their shape; some were columnar others definitely polyhedral, while the general arrangement

was more diffuse. In the secondary growths in the skin and muscles a definite squamous metaplasia had taken place; all transitional types of cell were noted, from columnar epithelium to squamous epithelium, the latter, arranged in cell masses, resembling those found in a typical squamous epithelioma. There was no actual formation of keratin by these squamous cells.

Remarks.

Squamous metaplasia of the bronchial mucosa is a not uncommon occurrence in tuberculosis and other pulmonary lesions. As a result a certain number of carcinomata arising from the bronchial mucous membrane are definitely squamous in type. In a few cases, as in those recorded by Kretschmar[1] and Henrici,[2] there was a mixture of squamous and columnar cells in the primary tumour, showing that metaplasia may take place in the established tumour. The present case is of interest owing to the fact that in the primary lung tumour—although this was preceded by a tuberculous lesion—there was no evidence of cell metaplasia; such a metaplasia was, however, well seen in certain of the metastases, notably those in the voluntary muscles and skin.

The distribution of the secondary growths is also of some interest. Adler (1912)[3] reports that the liver is invaded in 28·5 per cent., the adrenal in 10 per cent., and voluntary muscles in 2 per cent. of cases. In the present instance secondary metastases were absent from the liver, but were found in the pancreas, both suprarenals, kidney, skin, and voluntary muscles. The presence of skin metastases is of especial interest, since Suzuki (1918)[4] was only able to collect 115 cases of multiple skin metastases from cancer of internal organs, while in only three of these was the primary growth in the bronchus.

We desire to thank Mr. W. N. Boog-Watson for assistance in recording this case.

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Clinical and Laboratory Notes.

DIABETES MELLITUS
IN AN INFANT AGED FIVE MONTHS.

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THE following case is interesting on account of its rarity in a child so young.

History.—The baby, a female, aged 5 months, was seen by myself and admitted to hospital on August 16th, 1922, with the diagnosis of pyelitis. She was said always to have been a cross baby and difficult to rear. Many different feeds had been tried without much success. The stools were offensive and frequent.

Condition on Admission.—She weighed 11 lb. 13 oz., and she had a dry, scaly skin, which seemed to irritate. The urine (catheter specimen) was acid and cloudy, and contained a small quantity of albumin. Microscopically pus cells and *B. coli* in large numbers were seen. She was put on an alkaline mixture and milk and water feeds, which she took greedily.

Course of Case.—During the first three weeks in hospital she gradually lost weight, had frequent loose stools, had a continuous rise of temperature, and was always restless. The urine became much clearer and less acid, though the temperature became higher, for which fact we could not account. At the end of the third week the second toe of the left foot became black and gangrenous. The toe seemed quite painless and it kept quite clean. The urine was at once tested for sugar with Fehling's solution, which was reduced in the usual way. Further tests were made by Dr. A. Sellers, our honorary pathologist; Trommer's test and the phenyl-hydrazin test confirmed the presence of reducing sugar. There was never enough urine to estimate with accuracy the amount of sugar or the specific gravity. Two days later the second toe of the opposite foot started in the same way. A fortnight later both toes came off and the surrounding skin became healthier, although at one time it appeared as if the whole foot on one side would become gangrenous. The loss of weight was slow but gradual, although the infant took her feeds well. Directly the sugar was found she was put on whole-milk feeds, without added sugar, and a sodium bicarbonate mixture. The urine contained glucose till she died, six weeks after admission to hospital.

Towards the end the skin over the trunk and limbs became pustular and the infant had a continuous rise of temperature. She had wasted nearly three pounds and she was comatose for the last four days.

A CASE OF
ENDOTHELIOMA OF THE MALE BREAST FOLLOWING AN INJURY.

BY H. K. GRIFFITH, F.R.C.S. ENG.

THE following case is interesting on account of the rarity of the disease and its relation to an injury.

The patient, aged 50, in April, 1922, received a blow from a horse's bit just above the right nipple. A definite bruise formed and slowly disappeared. This was seen by one of my partners on several occasions, and at the end of May had cleared up except for a definite cystic tumour, which was freely movable in the surrounding tissues and not attached to the skin.

When next seen in the beginning of July the following condition was found. A distinct swelling was visible 1½ in. above the right nipple, with an area of discoloured skin over it about 2 in. in diameter. In the centre of this area there was a bulla containing a little fluid, the skin just not being ulcerated through. Beneath this could be felt a hard nodular tumour 1½ in. in diameter adherent to the skin and to the surrounding tissues, but not to the underlying muscle. No glands could be felt in the axilla or neck. The patient was definite that no tumour existed before the blow, but I concluded that probably it was a case of cystic adenoma becoming malignant. The patient was healthy and well built, with a large amount of subcutaneous fat.

Operation.—I removed the breast with the underlying pectoralis major muscle, but as I could feel no axillary glands and had some doubt about the diagnosis I left the axilla for a future occasion if necessary. The patient made an uninterrupted recovery from the operation.

Histological Examination.—The breast was sent to St. Bartholomew's Hospital Clinical Research Department, where it was examined by Sir Bernard Spilsbury, and the following report sent: The tumour (macroscopically) was encapsuled, and did not infiltrate the breast tissue or the skin which was much stretched over it at one point. On cutting into it the substance seemed to consist of necrotic material of a caseous nature, white in colour. The sections show a degenerating endothelioma—masses of endothelial cells fading away in many places into the structureless hyaline degenerate material. Foreign body giant cells may be seen in many parts, and at one corner of one of the sections some old organising blood-clot may be found.

It seems very probable that the injury led to the formation of a hæmatoma, and the irritation caused by the presence of this blood-clot gave rise to so much endothelial proliferation that an actual tumour, an endothelioma, arose in that situation. The treatment by local removal should be quite sufficient, judging by the microscopical characters of the tumour, to effect a cure.

Torquay.

A NOTE ON
BARIUM IN THE HARROGATE WATERS.

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BARIUM rarely occurs as a constituent of European mineral waters. This is due, no doubt, in some cases to the considerable amount of sulphates usually present, which with barium would provide a familiar instance of chemical incompatibility. The pharmacology of barium is well understood. While toxic in higher concentration, when administered in suitable doses it exerts a marked stimulating action upon all forms of muscular tissue and causes a gradual but sustained rise in blood pressure. Bain and Edgecombe [1]

[1] "Harrogate Waters," p. 22.

have shown that barium enables a purgative water to be taken continuously without resultant enervation. The substance is therefore a valuable constituent of the Harrogate waters in which it occurs. If, for any reason, barium is contra-indicated, one of the barium-free waters, of which there are several, would be prescribed. The following figures represent parts of barium per 100,000 in three important Harrogate springs: "Old Sulphur," 6·91; "Chloride of Iron," 3·51; "Magnesia," 3·97.

The accepted dosage of barium chloride ($BaCl_2 2H_2O$) is from 0·016 to 0·12 g., or 0·009 to 0·067 g. actual barium. This is the equivalent of 5–34 oz. of "Old Sulphur water." In spite of the insolubility of barium sulphate it is interesting to note that a very small quantity of sulphate is actually found in the above waters coexisting with the barium, to the extent of one part $BaSO_4$ per 140,000 in the case of the "Old Sulphur" and one part per 190,000 in the "Chloride of Iron."

According to Fresenius the solubility of barium sulphate in pure water is one part per 400,000. Certain salts—e.g., magnesium chloride and ferric chloride, increase the solution capacity of water for barium sulphate, and probably this explanation accounts for the ability which the above waters possess of holding barium and sulphate ions together in solution. These concentrations are, of course, very small and do not affect the general truth of the previous "incompatibility" statement, which has here a practical application. Experimental work in the Harrogate Laboratory has shown that sulphur water exposed to air undergoes several chemical changes, one of which is a slight but continuous production of sulphates, due to oxidation. If allowed to proceed practically all the barium is precipitated. Precautions are consequently taken so that the patients receive their mineral waters in the unaltered state.

TWO CASES OF CONGENITAL HEMIHYPERTROPHY.[1]

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THE following are good examples of a rare congenital abnormality.

CASE 1.—A female infant, aged 6 months, was seen at the out-patient department of the Children's Hospital, Great Ormond-street. She was an only child and had had no previous illnesses. The father and mother are healthy. The whole of the left side of the body had been noticed to be larger than the right side. The skull showed no definite asymmetry, the zygoma, ear, and cheek were all enlarged on the left side. The left breast and thoracic muscles were better marked than on the right side. The left arm and leg were markedly enlarged, and the leg measurements were as follows: Circumference of thigh at gluteal fold, left 12 in., right 10½ in.; circumference of leg at knee, left 9 in., right 7½ in.; anterior superior spine to internal malleolus, left 10½ in., right 10¼ in. The X ray shows a definite thickening and hypertrophy of the bones of the leg, the left tibia being definitely thicker and longer than the right. Apart from this condition no abnormalities were to be noted, and the child seems in every way normal.

CASE 2.—A girl, aged 13 years, presenting hemihypertrophy affecting part of the right side of the face. The parts chiefly affected are the zygoma, malar bone, and the superior maxilla, with the soft tissues covering them. The temporal bone and muscle are affected to a less extent, as are also the lower jaw and the masseter muscle. Measurement: External occipital protuberance to superior maxilla, right 11 in., left 10½ in. The ear and eye are unaffected; the discs are normal. An interesting feature is the condition of the teeth; the first permanent molar in the upper jaw on the right side is very large, but the corresponding tooth on the left is missing, so no comparison can be made. X rays show a general enlargement of all the bones of the skull. The rest of the body is unaffected and the child appears quite normal, mentally and physically. There is no history of trauma at birth; labour was normal. There are five other children, none of whom show any abnormality, the patient being the youngest but one.

Remarks.

This condition of hemihypertrophy is a very interesting one, and as around it centres the whole question as to what really governs growth, it has always excited a great deal of controversy. Various classifications have been given; false hypertrophy where the enlargement is due to an extensive nævoid or lipomatous growth of one side of the body or one portion of one side. In this type the soft parts only are affected, and the bones do not show thickening, nor is there lengthening of the limbs on the affected side. True hypertrophy, however, is the condition where all the structures are involved, including the subcutaneous tissue, muscle, and bone. In this type the limbs show lengthening as well as an increase in their girth. X rays show a true enlargement of the bones on the affected side. Arnold Gesell has collected 40 cases (reported up to 1921) of complete hemihypertrophy, where all the structures on one side of the body were involved, and 30 cases where the hypertrophy was partial and in some cases crossed, so that an arm was involved on one side and a leg on the other side. Gesell found that the hypertrophy was confined to the right side of the body in 70 per cent. of his cases and is slightly more common in males than in females. The condition is rarely seen in adults.

Along with this condition skin abnormalities such as nævi are sometimes found. Mental defect is also frequently associated with it. Many theories have been advanced as to how this hypertrophy is brought about, but few have anything to substantiate them. Dr. Robert Hutchison's case, which had a very complete post-mortem examination, showed a hypertrophy of all the internal organs on the affected side, especially the suprarenal. The side of the brain on the opposite to the hypertrophied side of the body has occasionally been found to be enlarged. It has been pointed out that the affected side looks older than the unaffected side, and that the carpus and teeth are seen by X rays to show hypertrophy and more advanced ossification on this side.

Some authors would attribute this hypertrophy to the action of the endocrine glands, and especially to the pituitary and the suprarenal. This is difficult to explain unless they act through the nerves, and the changes are then really neurotrophic. Fortescue-Brickdale reported a case in 1915, and argued that this condition was hypertrophy rather than atrophy for the following reasons: (1) The distribution of the enlargement was from a few digits to the whole of one side of the body, and it was thus absurd to think of the fingers being normal while the remainder of the body was atrophied; (2) cases of enlargement of opposite limbs are similarly difficult to regard as an atrophied condition of the whole body; (3) occasionally the smaller side was functionally more useful than the larger side; (4) post-mortems did not support the theories of atrophy, as the smaller organs appeared normal for the age of the patient.

Our thanks are due to Dr. Kenneth Smith, of Camberwell, for permission to show Case 1, and to Mr. O. L. Addison for Case 2.

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[1] Shown at the Royal Society of Medicine on May 26th, 1922.

Medical Societies.

OXFORD MEDICAL SOCIETY.

TREATMENT OF EMPYEMA.

AT a meeting of this Society held last month at the Radcliffe Infirmary, the President, Dr. E. MALLAM, being in the chair, Mr. F. J. HATHAWAY (Windsor) read a paper on this subject. He began by pointing out that the treatment of empyema—namely, incision and drainage by a tube—had not changed for the last 100 years. He hoped that soon the open drainage of a chest with a sucking wound would be looked on as a surgical abomination. The post-war surgeon was not satisfied with the eradication of disease or pus alone, but put before himself a higher ideal, namely, restoration of function, provided he ran no risk of septicæmia. In the case of the knee-joint, peritoneum, and pleura immediate closure of wounds had been more than justified by restoration of function.

As regards empyemata, Mr. Hathaway pointed out that the structure of the pleura was peculiar in that a rigid thorax was associated with a collapsible lung; in the treatment of empyema with collapsed lung, it was therefore essential that the lung should be encouraged to expand as fully and as early as possible, for it was not until the lung fully expanded that pleural suppuration would end. This full and early re-expansion of the lung could only be produced by immediate closure, because this method did away with the two great hindrances to lung expansion—namely, the effects of atmospheric pressure and secondary infection.

After quoting his own experience in gunshot wounds of the chest as surgeon to a casualty clearing station, he briefly reviewed the history of such wounds, pointing out that even in the thirteenth century Henri de Nondeville immediately closed the chest in order to avoid a "sucking wound." With the era of gunshot wounds proper, Felix Wurtz, in 1563, recommended that chest wounds should be closed, as also did Guthrie and Baron Larrey in the nineteenth century. During the American Civil War, the Franco-Prussian War, and the South African War there was no improvement till after the first year of the late war, when the era of immediate excision of gunshot wounds, introduced by Sir Henry Gray, of Aberdeen, led the way for the immediate closure of wounds of the chest, abdomen, and joints.

As an important point bearing on the treatment of empyemata Mr. Hathaway described the crippling effects on the lung of adhesions, even in a simple hæmothorax. Mr. James Berry had laid down as an axiom that "a good surgeon is one who knows when to use a drainage-tube and when to remove it." Mr. Hathaway went further in saying "a good surgeon is one who realises that restoration of function is more important than the use or abuse of a drainage-tube." The historical treatment of empyema by Hippocrates, Galen, and Lister was then outlined by the speaker, it being pointed out that Prof. Schede, of Hamburg, was the first to insist on the necessity for the whole hand to be introduced into the pleural cavity for the removal of clots and adhesions.

Mr. Hathaway then dealt with the method of immediate closure of pneumococcal empyemata. Early and complete restoration of lung function could only be satisfactorily accomplished by complete operation—i.e., by freeing the pleura of all adhesions. The three most important points in the technique of operation were:—

1. Bacteriological examination of pus after aspiration. He did not advocate the immediate closure in any but pneumococcal cases. In a mixed staphylococcal and pneumococcal infection, or in pure staphylococcal or pure streptococcal cases, he advocated the use of a "passage-tube," also called a rubber "dam," with closure of greater part of wound or use of Carrel-Dakin treatment.

2. Sufficiently large incision and resection of one, or section of two, ribs in order to allow the whole hand to be introduced into the pleural cavity, the object being to remove pus and fibrinous clots and especially the adhesions on the visceral pleura which would cripple lung expansion.

3. After operation, daily aspiration of the fluid, put into the chest, with an aspirating syringe between the lips of the wound. This was quite painless. The fluid used to fill up the pleural cavity was either a 2 per cent. suspension of iodoform in paraffin or more frequently flavine. Daily bacteriological examination of the aspirated fluid was carried out until the fluid became sterile, when the aspiration could be stopped.

Mr. Hathaway cited his own cases, nine since 1917; 11 cases lately done by Mr. P. H. Mitchiner at the Middlesex Hospital; and the better results claimed by Mr. R. T. Timberg at the Physico-therapeutic Department of St. Thomas's Hospital, as regards early lung expansion and freedom from scoliosis. He also quoted papers by Dr. J. A. Nixon[1] and Mr. J. A. Blake,[2] of New York, both of whom advocated immediate closure in suitable cases. Dr. Nixon, in fact, had stated his belief that the time would shortly come when open drainage of the chest would be looked on as a surgical abomination.

In conclusion, Mr. Hathaway claimed that the immediate closure of pneumococcal empyemata was now established, and that if the technique of early and complete operation were carried out the mutilating operation of Estlander would no longer be necessary later. Convalescence would be shortened and the physico-therapeutic results would be much better than they ever were with the use of a drainage-tube.

Discussion.

In the discussion which followed Dr. W. COLLIER spoke of the value of washing out the pleural cavity in cases which were not improving with ordinary drainage. Mr. H. A. B. WHITELOCKE emphasised the importance of the respiratory diaphragmatic movements in thoracic as well as in peritoneal drainage. Dr. A. G. GIBSON, Dr. W. STOBIE, and the PRESIDENT also took part.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

HEART DISEASE IN PREGNANCY.

A MEETING of this Society was held at Manchester on Dec. 15th, 1922, with Mr. HAROLD CLIFFORD, the President, in the chair.

Mr. A. LEYLAND ROBINSON (Liverpool) read a paper on Heart Disease in Pregnancy and said that the conclusions formed by Angus Macdonald in 1878 were in the main surprisingly applicable at the present time, although some modifications had to be made in view of the results of recent cardiological research. The latter had shown that cardiac murmurs did not necessarily indicate serious disease and that many systolic bruits were innocent if not actually physiological. The myogenic theory of heart conductivity had been demonstrated and a rational explanation provided for many types of formerly obscure cardiac irregularity. The discovery of auricular fibrillation had brought to light an important mechanism in the production of heart failure. Prognosis was now determined by the efficiency of the heart muscle and its capacity for work. A pregnant woman with heart disease was primarily a heart case, but the influence of pregnancy on cardiac disease and the special dangers of labour formed a problem of great importance to the obstetrician.

Pregnancy affected the heart and circulation in several ways: (1) An increased output of blood was demanded by the growing tissues (uterus, breasts) and by the placental circulation; (2) the uterine tumour produced certain mechanical effects by simple pressure on the base of the lungs and on the heart itself which was dislocated upwards and rotated to the left; as a result the pulmonary circulation was impeded and the right heart embarrassed. Pregnancy, therefore—and in particular labour with its severe muscular

[1] Bristol Med.-Chir. Journal, 1921.
[2] Annals of Surgery, April, 1922.

effort—implied cardiac strain and called up the reserve power of the heart; in health that reserve was quite adequate, but in disease such physiological response might be impossible and heart failure would then occur.

Mr. Robinson referred to 39 cases from the Liverpool Maternity Hospital comprising 26 mitral stenosis, 6 mitral regurgitation, 2 aortic regurgitation, and 5 functional cardiac disease. Five of these patients died: four from mitral stenosis, and one from aortic regurgitation and mitral stenosis. The effect of treatment was shown by the result in 17 cases of mitral stenosis (10 with severe and 7 with advanced disease). Of 12 women who received careful pre-natal supervision, 1 died (a difficult breech delivery), and 5 women who received no such treatment all died. Accurate cardiological diagnosis was essential before undertaking treatment, as many systolic bruits and arrhythmias had no pathological significance and no treatment was required. In the presence of organic disease, rest and prolonged observation were of first importance; the physiological activities of the patient must be limited and made to conform with the capabilities of the heart muscle. The appearance of signs of incipient heart failure (such as the persistence of crepitations at the pulmonary bases) indicated that the cardiac reserve was being seriously encroached upon and demanded special treatment.

Drugs of the digitalis group were chiefly called for by auricular fibrillation, whilst hæmatinics, regulated exercise, and nourishing food were of great value in improving the tone of the cardiac muscle. The termination of pregnancy might be called for under special circumstances. In early pregnancy, for the incipient heart failure of aortic disease for compensation once broken could not be restored by treatment or for a progressive decompensation in mitral stenosis when there was no response to digitalis. In advanced pregnancy the induction of premature labour was permissible for mild cases with full compensation, but was definitely contra-indicated in the presence of heart failure near term. The conduct of labour was a great responsibility and required careful consideration. During delivery per vias naturales morphia was extremely helpful in reducing the voluntary efforts of the patient and forceps might be employed to expedite delivery.

Cæsarean section would give better results, particularly in the case of a primipara where (1) the disease was severe and the heart barely compensated and the reserve poor, or (2) if there was the least reason to suspect delay or difficulty in delivery. Although many cardiac patients successfully passed their one or more confinements and the immediate result appeared to be satisfactory, the strain on the heart was rarely transient, but usually prolonged and sometimes permanent and irremediable. Apart from parturition many cardiac diseases were naturally progressive, as endocarditis, which was prone to occur, might convert a quiescent lesion into an active and progressive one. It was, therefore, doubtful whether repeated pregnancies should be allowed, and if not, the question of sterilisation would have to be cautiously considered in those cases where it was not possible to prevent conception.

The paper was discussed by Dr. DOBBIN CRAWFORD (Liverpool), Prof. W. E. FOTHERGILL (Manchester), and Dr. J. E. GEMMELL (Liverpool).

MIDLAND MEDICAL SOCIETY.

THE fourth ordinary meeting of the session was held in the Medical Institute, Birmingham, on Dec. 20th, 1922, Dr. C. E. PURSLOW, the President, being in the chair, and about 40 members present.

Exhibition of Cases.

Mr. A. W. NUTHALL showed a father and two daughters, who exhibited the combination of blue sclerotics and multiple fractures. The father had over 30 fractures, and both daughters had fractured several bones. Mr. Nuthall reviewed the literature of this interesting condition. The cases were discussed by Dr. A. P. THOMSON, who knew of four families exhibiting the same symptoms. He stated that in these cases the fractures were frequent up to the age of 10 years, and later much less so.

Dr. J. G. EMANUEL showed a man of 52, who for some years had suffered from attacks of a rare form of paroxysmal tachycardia. In the attacks, which lasted from 2 to 3 hours up to 3 to 4 days, the pulse was slow, 34 per minute, consisting of runs of 2, 3, 4, or 5 regularly spaced beats at a rate of 82. These runs were separated by pauses of 3 to 7 seconds in which no beats could be felt at the wrist and no heart sounds were audible over the præcordium. The electrocardiogram showed that the silent pulse periods corresponded to paroxysms of ventricular extrasystoles arising in the right ventricle at the rate of 173 per minute, as many as 17 being counted in a single paroxysm. In the paroxysm the ventricle drove the auricle with a reversed heart-block of 2 : 1 and sometimes 3 : 1. During the intervals between the attacks the pulse was regular, at a rate of 60 to 66 per minute. A similar case was described in *Heart*.[1] These cases were clinical counterparts of the paroxysmal tachycardia experimentally produced by Sir Thomas Lewis by ligature of the right coronary artery.[2] Dr. Emanuel's case was discussed by Mr. W. H. BUNTING, Dr. K. D. WILKINSON, and Dr. G. H. MELSON.

Pasteurisation of Milk.

Dr. JOHN ROBERTSON, M.O.H., Birmingham, read a paper on the Pasteurisation of the Milk-supply in Birmingham, emphasising the following points: About 75 per cent. of the milk-supply in Birmingham was at present pasteurised or sterilised in order to prolong the life of the milk. Several firms sterilised milk in bottles. Milk should be efficiently pasteurised, then cooled to a temperature of 40° F., and bottled in a bottle which has been sterilised. Such milk was safer than any other variety of milk, pathogenic organisms—tubercle, enteric fever, scarlet fever, sepsis, &c.—being killed. No contamination could take place until after the bottle had been opened in the consumer's house. Probably less damage to vitamins was caused than by nursery heating. The keeping properties were better. Because the milk was clean, safe, and of good quality more milk was used. Dr. Robertson's paper was discussed by Dr. MELSON and Dr. J. J. ROBB.

DEVON AND EXETER MEDICO-CHIRURGICAL SOCIETY.

Exhibition of Cases.

A MEETING of this Society was held at the Royal Devon and Exeter Hospital on Dec. 21st, 1922, Dr. G. P. HAWKER, the President, being in the chair.

Dr. F. A. ROPER showed a boy, aged 11, whose condition pointed to deficiency of posterior lobe of pituitary gland (? Frohlich's syndrome). There was no history of injury during parturition or of prenatal infection. The boy weighed 14 lb. at birth, had steadily gained in weight, but had never been able to walk owing to an affection of the muscles not unlike that resulting from anterior poliomyelitis. The knee-jerks were absent, but other reflexes were normal and the hand grasp up to the average. There were no ocular symptoms and intellectually the boy was bright. The skin was thin and clear. Wassermann reaction had proved negative. The sugar tolerance was appreciably raised, an ingestion of 250 g. being possible without production of glycosuria. X ray showed the pituitary fossa to be normal or possibly smaller than normal.

The PRESIDENT showed a case of Optic Atrophy in a young woman. The disease was unilateral and the

[1] Heart, 1912–13, iv., 128. [2] Ibid., 1909–10, i., 98.

symptoms first showed themselves when the patient was recovering from double phegmasia alba dolens following childbirth. The condition appeared to have arisen from embolism of the central artery.

Mr. A. L. CANDLER showed a man with enlarged gland above the inner extremity of the left clavicle—probably malignant—the case being of interest in that there was no other evidence of recurrence after removal of the tongue for carcinoma in 1920. He mentioned the peculiarity of the lymphatic supply to the tongue which would account for the distant throw of the secondary growth.

Mr. CANDLER also showed:—

1. Ovarian Cyst removed from a nurse who gave a clear history of illnesses diagnosed as "appendix abscess" and "pelvic tumour with obstruction" eight and six years ago respectively. On each occasion the immediate operation advised was refused, but two months ago pelvic pain and dysmenorrhœa decided her to submit to exploration. The points of interest were: (*a*) Both ovaries were without pedicle and adherent to surrounding structures; (*b*) both contained dark red material not unlike motor grease at a summer temperature—there was no fluid; (*c*) history non-suggestive of ovarian cyst during past six years.

2. Fibroid of Uterus which had been extruded into the vagina, the lower part having become gangrenous and there being a thick intra-uterine pedicle. The cervix had been examined and found normal some four weeks prior to operation.

Dr. R. V. SOLLY showed microscopical sections illustrating a series of tumours of the breast.

Reviews and Notices of Books.

SCOTT'S ANTARCTIC EXPEDITION (1910–1913).

The Worst Journey in the World. By APSLEY CHERRY-GARRARD. London: Constable and Co. 1922. Pp. 585. £3 3*s*.

THE author of these volumes, which deal with Scott's last Antarctic Expedition (1910–1913), states in the introduction that the nine years' delay in the appearance of his book was caused partly by the war and partly by the effects of the expedition upon his physical condition. The intervening time is not a matter for regret, for it has enabled the author to bring together in his book an unbiassed survey of the hardships and work of the various sections of this expedition. The volumes tell the tale of what is known as "The Winter Journey," and make a special appeal to the medical reader, for they picture in vivid and stimulating terms the courage and endurance of the medical members of the party. The story is told of Dr. Murray Levick, who, stranded with Campbell's party at Evans's Coves, was forced to face the Arctic winter without sufficiency of clothing, food, or accommodation, and managed to carry on with the help of physical exercises and simple remedies; and of Surgeon-Commander E. L. Atkinson, in charge of the whole expedition while Scott was away, because Lieut. Evans was sick and on his way to England. The author referred to this command in these words: "The part fell to Atkinson, and I hope that these pages will show how difficult it was, and how well he tackled it"—indeed they do. Again, for the record of the indomitable spirit and scientific zeal of Dr. A. E. Wilson on a winter journey in search of the embryos of the Emperor Penguin, or on that last journey from which he never returned, we are indebted to the author of these volumes. His book is a monument to the influence of medicine upon such undertakings, from the first conception of the efficiency of the physical material, through the perplexing questions presented by apportioning Polar rations or dealing with such scourges as scurvy and dysentery, up to that final and paramount matter of the maintenance of "heart."

There are many stirring records of human endurance simply told. Dr. Levick referred to one incident as follows: "We started on our journey; this lay, first of all over quite half a mile of clear blue ice, swept by the unbroken wind, which met us almost straight in the face. We could never stand up, so we had to scramble the whole distance on all fours lying flat on our bellies. By the time we had reached the other side, we had had enough." On the winter journey Mr. Cherry-Garrard started away from the barrier with two or three blisters an inch long on each of his fingers; he eventually obtained relief only when he was able to thaw out, and then puncture, the blisters after supper! He gives a vivid picture of pain when he says, "to handle the cooking jar with the matter inside these big blisters frozen into ice or to touch the food bag was agony; to start the Primus was worse." In a temperature of from minus 60–77° Fahrenheit the description of the frozen clothes and sleeping bags must be read to appreciate the limits of endurance to which the human body can be put and still survive.

In the account of dysentery and scurvy and the means taken to mitigate these diseases, there is much of interest; frost-bite and minor ailments caused trouble, not least among these being cramp in legs and stomach. Campbell's party suffered chiefly from scurvy and ptomaine poisoning, while an interesting comment on dysentery is "they had some Cerebos salt, however, and used it for a week to stop the disorder." As to food, the following note is significant: "There were red-letter days, however, such as when Browning killed a seal, and in his stomach found, 'not too far digested to be still eatable,' 36 fish." One cannot help wishing, as one reads these pages, that the knowledge we possess to-day of vitamins, and of the influence of variety in food on the digestibility of meals, had been at the disposal of this expedition. The rations of the winter journey party consisted of—(Wilson) 8 oz. butter, 12 oz. pemmican, and 12 oz. biscuits; (Bowers) 16 oz. pemmican, 16 oz. biscuits; (Cherry-Garrard) 20 oz. biscuits, 12 oz. pemmican. Imagine this each and every day for six weeks! When we consider these rations it must increase our wonder and respect for those men who in the middle of an Antarctic winter went out on a six weeks' scientific expedition. The party started out on rations which they regarded as tests of fat, protein, and carbohydrate rations, in order to gain experience for the sake of those who were to make the supreme dash for the Pole the following summer.

The tale of the Scott expedition has been told from many sides, but the perspective shown in this latest account of it makes it an ever new and wonderful story.

GLYCOSURIA AND DIABETES.

Modern Methods in the Diagnosis and Treatment of Glycosuria and Diabetes. By HUGH MACLEAN, M.D., D.Sc., M.R.C.P. Lond., Professor of Medicine, University of London: Director of the Medical Clinic, St. Thomas's Hospital. London: Constable and Co., Ltd. 1922. Pp. 159. 12*s*.

THIS book is written on the same lines as that on "Renal Diseases" by the same author. The physiology of sugar metabolism, the types of the disease, the principles and details of treatment are all dealt with in turn. A good account is offered of the physiology of the disease, and the normal and abnormal variations in the blood-sugar after a dose of sugar. A description is given of the author's recognised method for estimating the sugar in the blood. Bertrand's method is employed for estimating the sugar in the urine, but although it may be very accurate is hardly suitable for the busy practitioner, and, indeed, this may be said of some of the other methods which are described, and which are more suitable for the laboratory worker.

The principles of modern treatment are given fully, and the quantities of the food advised for each day are clearly set out. The plan of treatment recommended closely resembles the original one

devised by Allen. Allen[1] has now modified the treatment considerably by abandoning the preliminary testing of the carbohydrate tolerance with increasing quantities of vegetables. In Maclean's scheme this preliminary testing lasts seven days. A good table of caloric and sugar values is given.

There are certain points which need comment. In the title of the book the name of the disease is given as "Diabetes," presumably by an oversight, for no form of diabetes other than diabetes mellitus is dealt with. Although the author realises that aceto-acetic acid or diacetic acid is always present in the urine if acetone is present, he causes confusion on two occasions. Thus, on p. 88 he heads a paragraph Rothera's Test for Acetone, but promptly explains that the test is much more sensitive for diacetic acid than for acetone. But on p. 52 he says: "Acetone was present in five cases, while the urine of one of the patients contained diacetic acid as well." The value of the ferric chloride test in conjunction with Rothera's test is carefully explained. The author prefers to use Fehling's solution for testing the urine for sugar, and explains the cause of the doubtful reactions which are obtained. The absence of references (nine only are given) is unfortunate, for it might lead the reader to suppose that the author claimed priority for the observation that lævulose does not cause a rise in the blood-sugar, whereas this effect was described by Bergmark in 1914, seven years before Maclean and de Wesselow published their paper.

We have called attention to small defects in a very useful volume. The practitioner will appreciate particularly the section on Treatment, even if some of the laboratory tests are rather outside his scope.

RADIOTHERAPY IN SKIN DISEASES.

X Rays and Radium in the Treatment of Diseases of the Skin. By GEORGE M. MACKEE, M.D., Assistant Professor of Dermatology and Syphilology, Columbia University. London: Henry Kimpton. 1922. Pp. 602. 45*s*.

THE history of radiotherapy in diseases of the skin is very like that of vaccine therapy. As Dr. MacKee points out in a historical review at the beginning of his book, it may be divided into three eras—optimistic, pessimistic, and realistic. The initial wave of enthusiasm that followed the application of Rontgen's discovery to the treatment of disease by Schiff and Freund was to an extent checked when some of the earlier workers and their patients developed radiodermatitis from prolonged and frequent exposure, and Brown and Osgood demonstrated that the rays could produce sterility. Then followed attempts to measure both the quality and quantity of the X rays, and, as the result of the experiments of Sabouraud and Noiré, Holzknecht, Corbett and others, whereby reliable radiometers were perfected, these tragic accidents became less frequent, though their effect is still apparent in the reluctance of some patients to submit to X ray treatment. While comparatively rare nowadays, cases of permanent alopecia from overdosage in the treatment of tinea tonsurans still continue to occur, and it is not to be wondered at that parents occasionally refuse to allow their children to run the risk of such an irremediable disaster. In 1914 Coolidge produced his electron tube, which has proved to be far superior to the ordinary gas-tubes, and at the present time X ray therapy may be considered as a safe procedure in the hands of those who have mastered the technique and who are aware of the possible after-effects of injudicious dosage. Unfortunately, however, in this country at any rate, X ray treatment for diseases of the skin is sometimes undertaken by those who, although expert technicians, have no special knowledge of dermatology, and this is a practice to be condemned, since the dosage and number of applications required in a given case depend on dermatological knowledge and experience, without which even the most competent radiologist may go astray.

[1] Jour. Amer. Med. Assoc. 1920, lxxiv., 571.

Dr. MacKee is not only a dermatologist of the first order, but he has devoted himself especially to radiotherapeutics, and his book is the product of an experience of radiotherapy in skin diseases probably second to none. The earlier chapters deal with the history and general physics of the X rays, the various types of apparatus and tubes, radiometry, and the technique of X ray and radium therapy. Then follow informing chapters on the chemical, biological, and biochemical effects of the X rays and radium, the clinical features of radiodermatitis, its treatment, its pathological histology (illustrated by excellent microphotographs), the action of radiation on pathological tissues, and general therapeutic considerations. The remainder of the book is devoted to a detailed consideration of the various diseases of the skin in which radiotherapy is indicated or has been tried, and not only are brief clinical descriptions given, but methods of treatment other than by radiation are also mentioned. It is pleasant to record that Dr. MacKee is in no way afflicted by radiomania, and he does not hesitate to state that radiotherapy is inadvisable in those diseases in which experience has shown it to be without effect, nor does he omit to mention his failures in conditions usually amenable to the X rays or radium. As an example of the author's wide experience, we may mention that he has treated 30 cases of mycosis fungoides with X rays and radium, and his conclusions coincide with those of most dermatologists—namely, that although radiotherapy usually prolongs life and gives relief in this disease it cannot be said to cure it. In the chapter on hypertrichosis, Dr. MacKee discusses in logical fashion the pros and cons of treatment by radiation, and gives the views of leading authorities both in America and other countries. The majority do not hesitate to condemn the method outright, owing to the risk of subsequent atrophy and telangiectasia of the skin; with this Dr. MacKee concurs, and he deals with the medico-legal aspects of the question, pointing out that "not even a signed, witnessed, and sworn statement, in which the patient states that she appreciates and accepts the risk," can prevent the institution of a suit for malpractice. A point of interest is that Dr. MacKee is not convinced that filtered rays are better than unfiltered for this treatment, in spite of the contrary opinion of those who still employ the method.

The book closes with an adequate statistical and descriptive account of the treatment of malignant new growths of the skin, and a chapter on the medico-legal relations of Rontgen and radium therapy. Throughout a large number of references are given at the end of the various chapters, and we consider that Dr. MacKee has, in writing this work, rendered a great service to dermatology and radiology.

TUBERCULOSIS IN MEN AND ANIMALS.

L'Infection bacillaire et la tuberculose. Chez l'homme et chez les animaux. Second edition. By A. CALMETTE. Paris: Masson et Cie. 1922. Pp. 644. Fr.50.

THE first edition of this book was exhausted a few weeks after its publication, and in preparing this, the second, edition the author has incorporated a separate chapter on chemotherapy. This chapter is a survey of recent research, and though it deals with a diversity of experiments, it is not very hopeful with regard to the future of this line of attack on the tubercle bacillus. In other respects this edition differs but little from its predecessor—a work of enormous dimensions. To attempt a comprehensive review would be like undertaking to make an inventory of the British Museum on a piece of notepaper. Had the author confined himself to an account of his own investigations, he could, no doubt, have filled a large volume. But this is just what he does not do. The book is, in fact, a most painstaking digest of every important piece of research ever carried out in tuberculosis. Naturally such a survey has to be greatly condensed if space is to be found for all that

is important, and the author has taken the wise line of keeping strictly to facts, and the most logical deductions therefrom, without launching out into those top-heavy creations of the imagination, those ingenious theories which appeal to authors who may be thinkers but are not always observers.

The book, then, being too large even for a bird's-eye survey of the whole, it is best to fall back on review by sample. Let us take Chapter V., for example. Here, in the space of 23 pages, an account is given of the toxins of the tubercle bacillus, of exo- and endo-toxins, and of the best known tuberculins. These number 20, and a short account is given of the manufacture, dosage, and peculiarities of each. Separate chapters are devoted to tubercle of the serous membranes, of the skin, the blood, and other tissues, and a whole chapter is given to the question of heredity, predisposition, and familial contagion. The second part of the book is chiefly concerned with experimental tuberculosis and the behaviour of the disease in animals. The third part deals with the defensive mechanism and with diagnosis. The fourth part concerns immunity, natural and acquired, and there is a long chapter on the problem of vaccination. This is, of course, not yet solved, and the author has little good to say of such ventures as those of Friedmann. But—and this is perhaps the most hopeful topic discussed—the author does anticipate as a practical and feasible proposition the ultimate suppression of tuberculosis as a fatal disease by a system of prophylactic inoculation. Without this means the problem would surely be insoluble, for, according to the author, every tuberculin-positive man and animal is sometimes a distributor of tubercle bacilli, and as the overwhelming majority of adult human beings give a positive reaction to tuberculin, there is no prospect of stamping out the disease merely by preventing infection. The book is beautifully illuminated by illustrations, many of which are coloured. They not only show a variety of morbid lesions, but they also show the various ways in which animals can best be inoculated. Only by personal demonstration, or by pictures, is it possible in a book to show at a glance how a guinea-pig, for example, should be held when tubercle bacilli are to be introduced into the stomach, subcutaneous tissues, and eye respectively.

It is a sad, but true, fact that first-class authorities sometimes write third-class books. Some first-class books are written by almost unknown authors. Here we have a first-class book by one of the admittedly greatest authorities in the world on tuberculosis, and it belongs to that small—very small—class of books about which editors write to their reviewers: "Please let us have this book back for the editorial library."

MANUAL OF OPERATIVE SURGERY.

Fifth edition. By H. J. WARING, M.B., B.S., F.R.C.S., Surgeon and Joint Lecturer in Surgery, St. Bartholomew's Hospital; Vice-Chancellor and Dean of the Faculty of Medicine, University of London. Oxford Medical Publications. London: Henry Frowde and Hodder and Stoughton. 1922. Pp. 829. 15*s*.

THIS well-known manual of operative surgery has been revised and shows many innovations, both in the text and illustrations. It is valuable as being the work and views of a surgeon of wide experience, who has stamped his personality on it. Thus, in the section on the œsophagus, the author describes very clearly the operation of inversion for an œsophageal diverticulum, an account of which does not appear in the usual text-books of surgery. He also recommends the suturing of ruptures of the spleen and has obviously had success in this procedure. He is a strong adherent of routine removal of the gall-bladder for gall-stones—a view to which all will not accede.

These examples show the progressive nature of Mr. Waring's work; yet this progressiveness is tempered by a conservatism elsewhere in the book. In the section on operations on the thyroid, for example, there is no mention of the extreme usefulness of intratracheal anæsthesia; again, laryngotomy is advised before excising the tongue, an operation which is quite unnecessary when the tracheal method of anæsthesia is used. There are a few other omissions, such as a description of the removal of the ulcer-bearing area of the stomach as practised by the Leeds school, the methods of blood transfusion, the removal of carcinoma of the rectum through the perineum with suture of the upper end of the gut, a permanent colostomy having been performed. It is true that the first of these operations is not yet firmly established, and to the last there are certain theoretical objections, but they would seem to deserve mention. The author recommends irrigation of the peritoneal cavity after suturing a perforated gastric ulcer, though many surgeons have abandoned this. We are relieved not to find gastro-jejunostomy advised as a routine after closing the perforation; indeed, the possibility of doing it at the same time is not brought forward.

Views change so rapidly in surgery that new methods will fall into disuse with increasing experience, whilst discarded methods are sometimes revived as being the better. A critical attitude in choosing and recommending operative procedures is most desirable in a writer of such a widely read text-book as this. The volume gives ample evidence that the author is not only endowed with this faculty, but has the courage, born of experience, to set forth only those methods which he has found to be followed by success. We predict that the fifth edition will be even more widely read than its predecessors.

THE LIFE OF LORD MOULTON.

By H. FLETCHER MOULTON. With a Preface by the EARL OF BIRKENHEAD. London: Nisbet and Co. 1922. Pp. 287. 15*s*.

IT has been stated that the late Lord Moulton's individual contribution to winning the war was as great as that of any living Englishman. The statement can now be verified in the competent biography which filial piety has compiled. The chapter on the Fight for Amatol is an epic of chemistry. It tells how a learned judge, temporarily transplanted from the House of Lords to the Ministry of Munitions, raised our output of high explosive from one ton to over a thousand tons a day. In thus satisfying the requirements of our armies and making substantial provision for our allies as well, Moulton was not handicapped by the supposed defects of the mere civil servant, the mere business man, or the mere professor. There was no red tape in his department, and he must have treasured the classic example which his biographer prints in full, a five-page extract from a Q.M.G. file on the rationing of certain rats required for use in poison gas factories.

Not every schoolboy prodigy fulfils the promise of youth. John Fletcher Moulton at the age of 16 headed all England in the Oxford and Cambridge Local Examination. He went on to be Senior Wrangler (with double the number of marks gained by his nearest rival), an advocate with almost a monopoly of the big technical cases, the first practising barrister to become a Fellow of the Royal Society, a Member of Parliament, a Lord Justice, and afterwards a Lord of Appeal, the first chairman of the Medical Research Council in 1912, and finally Director-General of Explosive Services during the war. The record speaks for itself. Had he given his whole attention to science, he might have made some notable contribution to knowledge. But the combination of law and science made an irresistible appeal to his gift of lucid exposition. His opening of a technical case about patents or trade-marks was that of an expert witness in wig and gown. Chancery judges told one another that in their courts Moulton generally gave the scientific evidence while the witnesses argued the law. This gift of exposition was not less conspicuous in politics. One of Sir Frank Lockwood's best House of Commons caricatures, made during the death duties debates in 1909, shows "Mr. Fletcher Moulton explaining the

Chancellor of the Exchequer's Budget to Sir William Harcourt."

He knew his limitations, refusing a brief for the defence of Mrs. Maybrick against a charge of murder based on allegations of arsenical poisoning, then not so familiar as now, on the ground that he had but little experience of work before a jury. His appointment to the Court of Appeal was not universally acceptable, but he soon silenced his critics. His judicial instinct was sure. He delivered many dissentient decisions, but the bar often found these justified on further appeal to the House of Lords. The legal profession will remember him for his judgments, which were lengthy but illuminating, the medical profession for his reasoned opposition to the anti-vivisectionists. The general public will remember him as the man who, in the cant phrase, "delivered the goods," and who beat the Germans in their own field of applied chemistry. Had the war lasted through 1919 the enemy would have been treated to their own medicine in the form of mustard-gas on a scale which they had never contemplated.

Lord Moulton's biography is well planned and welcome. It provokes neither controversy nor personalities. His memory will not be the less honoured by reason of the fact that, though his circle of legal, political, scientific, and social acquaintance was wide, he kept no diary.

PATHOLOGY, GENERAL AND SPECIAL.

For Students of Medicine. Fifth edition. By R. TANNER HEWLETT, M.D., F.R.C.P., D.P.H., Professor of Bacteriology in the University of London, &c. London: J. and A. Churchill. 1923. Pp. 531. 18*s*.

IN reviewing previous editions of this popular manual we pointed out that the subject of general pathology is less beset by rigid bounds than any other in the medical curriculum. And it is fortunate for the student that Prof. Hewlett takes as his standpoint very largely vital pathology and not the irremediable end-results of the dead-house. The author as pathologist does not lose sight of the author as physician. For the same reason the subject is in constant flux, and Prof. Hewlett has been at pains to incorporate, and not merely add, new matter in each successive issue. The present (fifth) edition has again been revised and in part rewritten. New sections on deficiency diseases, allergy, encephalitis lethargica, herpes, and blood-grouping have been added, and several excellent plates and figures have been introduced. It is, of course, impossible in a work of this size to deal adequately with all branches of pathology, and such sections as those dealing with difficult and controversial subjects, arterio-sclerosis, the endotheliomata, chronic nephritis, and the like, must necessarily suffer by condensation. Nevertheless, the author has managed to compress a vast amount of information in a small space, and loses no opportunity to refer to new and significant work. Within its limitations this book will be found a sure and safe guide to the study of pathology and may confidently be recommended to students.

MICROSCOPICAL EXAMINATION OF FOODS AND DRUGS.

Third edition. By HENRY G. GREENISH, F.I.C., F.L.S., Professor of Pharmaceutics to the Pharmaceutical Society of Great Britain. London: J. and A. Churchill. 1923. Pp. 386. 18*s*.

IN preparing the present edition of this standard work the author has restricted himself to a careful revision of the text and has not increased the size of the volume, lest a higher price might place the book beyond the reach of many for whom it is intended. Users of the book who are past the student stage will probably regret that space could not be found for some additional matter, for instance, a concise account of quantitative methods in microscopy. The book is invaluable to those engaged in the analysis of foods and drugs; the descriptions of methods of examination and microscopical appearances are clear, comprehensive, and accurate; there is a large number of clearly drawn illustrations which are especially useful in the identification of powders. The subjects include all the important vegetable drugs, such as belladonna, digitalis, cascara, and nux vomica, as well as others less frequently heard of. Besides a description of these and of the common foods, cereals, cocoa, and so forth, there is a useful account of hairs and textile fibres. A section on the materials used in adulterating foods and drugs is included, and also a general scheme for the examination of powders.

The book will retain its position as the standard for teaching and reference on a highly technical and difficult subject.

THE THOMAS VICARY LECTURE.

A Glimpse into the History of the Surgery of the Brain. Delivered before the Royal College of Surgeons of England on Dec. 8th, 1921, by Sir CHARLES BALLANCE, K.C.M.G., M.S. Lond. London: Macmillan and Co. 1922. Pp. 110. 10*s*. 6*d*.

FEW persons outside the medical and anthropological world know that the surgery of the brain, which has made such gigantic strides during the last 50 years, goes back in a primitive form to Neolithic times. The old and the new are for ever meeting, and what is practically Neolithic surgery is still practised by the Shawiyas and Arabs of the Aures district in Algeria, a district lying between Timgad and Biskra.[1] Sir Charles Ballance, whose Thomas Vicary lecture appeared in THE LANCET shortly after it was delivered,[2] traces the history of the surgery of the brain from Neolithic times down to to-day, and many will be glad to possess the lecture in book form.

STUDIES FROM THE ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH.

Reprints. Vol. XLII. 1922. Pp. 616.

THIS volume consists of reprints of articles which have already appeared in various journals, reporting on work carried out in the Rockefeller Institute or under its grants elsewhere. The articles, 57 in number, are grouped under the headings Pathology and Bacteriology, Biophysics, Physiology and Pharmacology, Chemistry, Experimental Surgery, General Physiology, the Hospital of the Rockefeller Institute, and Animal Pathology, and reference is further facilitated by excellent indexes to authors and subjects. A wide range of subjects is covered, and though the articles are not equal in merit there is ample material here to interest workers in many fields. For example, W. C. Stadie describes the construction of an oxygen chamber and its use in the treatment of the anoxæmia of pneumonia; he suggests that the severity of this condition is an expression of the degree of impairment of the respiratory surfaces of the lungs. Dr. H. Noguchi's paper on the venereal spirochætosis of rabbits is reprinted here, as are also the series of papers by Dr. E. Uhlenhuth on the effect of iodine and thyroiodine on the growth of salamander larvæ. In a paper on cytological nomenclature Dr. E. V. Cowdry draws attention to the absurd reduplication of names which has crept into cytological literature; he has collected no less than 41 synonyms of mitochondria and points out with justice that this orgy of word-making cannot fail to embarrass progress in this science. Dr. F. L. Gates describes a new macroscopic agglutination technique which appears to differ not at all in essentials from the technique described by Sir A. E. Wright many years ago and elaborated in numerous publications since; at any rate, if there be any differences they are not brought out by the author.

The multiplication of scientific journals makes such a publication as this extremely valuable, and it is disappointing, therefore, to find that the series of papers on experimental diabetes which have appeared in the new *Journal of Metabolic Research* are not reprinted but merely referred to.

[1] W. Hilton Simpson: Arab Medicine and Surgery, Oxford University Press, 1922. [2] THE LANCET, 1922, i., 111, 165.

Reports and Analytical Records.

STABILARSAN.

(BOOTS PURE DRUG COMPANY, LTD., NOTTINGHAM.)

STABILARSAN is a chemical compound of "606" with pure medicinal glucose, and is supplied in ampoules in liquid form ready for either intramuscular or intravenous injection. The preparation has had prolonged clinical trial at St. Thomas's Hospital and elsewhere, and the results have been good, vexatious immediate reactions or delayed toxic manifestations not being recorded. The toxicity of starbilarsan is, as a matter of fact, lower than that of other arsenobenzol preparations, but freedom from toxicity has clearly been attained without any prejudice to therapeutic activity. Ampoules containing doses ranging from 0·10 to 0·90 g. are supplied, and administration is made simple, the syringe being filled directly from the ampoule with no addition of distilled water. This is evidently a very valuable preparation.

ALLENBURYS DIABETIC FLOUR.

(ALLEN AND HANBURYS, LTD., 37, LOMBARD-STREET, E.C. 3.)

When analysed this preparation was found to have the following percentage composition: moisture (loss at 100° C.) 9·2, protein (casein and lactalbumin) 76, fat 0·7, residual mineral matter 6·5. The flour is entirely free from carbohydrates (milk-sugar and starch). The statement that it is a mixture of caseins and lactalbumin to which cream of tartar and bicarbonate of soda have been added as leavening agents is confirmed on analysis. The flour serves as a convenient basis for preparing palatable carbohydrate-free foods, and directions for making such foods are supplied with the product. The flour should be found useful in indicated cases. The casein in it is digested with ease, taking the place of other forms of protein in the diet, and the property of neutralising "acidity" being considerable, it can be employed in cases of dyspepsia arising from over-acidity.

"ALMATA."

(KEEN, ROBINSON AND CO., LTD. INCORPORATED WITH J. & J. COLMAN, LTD., LONDON.)

The Local Government Board in 1914 issued a valuable report (New Series 80) on the use of proprietary foods for infant feeding, their analysis and composition, and generally surveyed the position from a dietetic point of view. The various analyses showed that whilst some of the foods were prepared with a reasonably proper balance of the constituents, others consisted of starch (generally heated flour) to which sometimes cane or milk sugar had been added. Information, similar to that contained in the official report, accumulated with the increased knowledge concerning food values acquired during the war, and the important part played by vitamins is to-day reflected in the character of infants' and invalids' foods prepared by the more progressive manufacturers.

Almata is such; it is a carefully-thought-out attempt to provide a food which contains soluble carbohydrates, fat, protein, mineral constituents, and the vitamins A, B, and C in suitable proportions. When analysed the following results were obtained:—

Moisture	1·5%	Fibre	0·4%
Mineral matter	2·32%	Carbohydrates	61·7%
Containing phosphates (P_2O_5)	0·66%	Active amylase	Present.
Proteins	11·37%	Reaction	Neutral to litmus.
Fat	23·1%	Preservatives	Absent.

The carbohydrates, consisting of malto-dextrins, maltose, &c., are mostly soluble in water. Of the proteins 25 per cent. are already soluble, a further 55 per cent. are dissolved during peptic and pancreatic digestion, and 20 per cent. are insoluble. The protein is partly derived from eggs which contain the water-soluble B-vitamin. The fat, in which the majority of infants' foods show a deficiency, is derived from milk and egg, both of which are the source of the fat-soluble A-vitamin. The water-soluble C-vitamin is introduced in the form of fresh fruit juice.

The manufacturers have submitted to us the results of feeding experiments with Almata, carried out at one of the best-known physiological laboratories. In the case of rats the growth was normal and their general condition was good, and when the diet was continued with the offspring of these rats their growth was also normal, providing a practical test of the efficiency of the diet. Further, certain tests were carried out under medical supervision, in which the food was given to infants and mothers, and the results recorded are satisfactory. That the food is of constant composition and keeps well is shown by the following figures:—

—	Moisture per cent.	Protein per cent.	Reaction.	Active amylase.
Made 3 months ago	2·7	11·4	Neutral.	Present.
,, 2 ,, ,,	2·3	11·6	,,	,,
,, 1 month ,,	1·5	11·4	,,	,,

Almata has a pleasant flavour and is only slightly hygroscopic. The food may be given to infants from 1 month old upwards.

PAVON.

(SOCIETY OF CHEMICAL INDUSTRY IN BASLE. SOLE CONCESSIONAIRES: CLAYTON ANILINE CO., LTD., PHARMACEUTICAL DEPT., 68½, UPPER THAMES-STREET, E.C. 4.)

Pavon is described as a standardised opium preparation representing the total alkaloids of the drug; in other words it is opium from which the inert and inactive substances are removed. It contains 25 per cent. of morphine and from 20–21 per cent. of the secondary alkaloids. We have examined Pavon liquid (in 15 per cent. alcoholic solution) and find in each c.cm. of it 0·022 g. of total alkaloids, which confirms the manufacturer's figure of 0·020. Pavon is also supplied in tablets and in ampoules, each one of which contains 0·02 g. alkaloids. The prolonged administration of Pavon, it appears, does not cause nausea or constipation; this advantage is due probably to the relative amounts of morphine and secondary alkaloids in the preparations.

Another preparation is *Pavon-Scopolamine* contained in ampoules, each containing ¼ gr. Pavon and 1/200 gr. of scopolamine hydrochloride.

Hemypnone, a "twilight-sleep" product, is made up in tablets, each containing diacetylmorphine diallylbarbiturate 0·005 g. and trichlor tertiary butyl alcohol 0·5 g. When analysed we found chlorine equivalent to 0·48 g. of trichlor tertiary butyl alcohol per tablet. It will be apparent that the combined morphine in such a preparation is not the only analgesic present, but is supplemented by the trichlor tertiary butyl alcohol, which splits up in the organism to its component parts, chloroform and acetone.

THE LATE DR. H. POOLE BERRY, O.B.E.—Dr. Harry Poole Berry, medical officer of health for the Grantham Urban District, who died on Dec. 20th, 1922, received his medical education at Guy's Hospital, becoming M.R.C.S. in 1882. In the following year he graduated M.B. in the University of London. In 1888 he took up his post at Grantham, where he was also school medical officer to the Borough Education Committee and for many years an honorary surgeon to the Grantham Hospital. At the time of his death he was chairman of the Kesteven Division of the British Medical Association. Dr. Berry held the rank of Major, R.A.M.C. (T.), and earned the Territorial Decoration and the Volunteer Long Service Medal; prior to the formation of the Territorial scheme he was attached to the 2nd Battalion of the Lincolnshire Regiment, and during the late war saw service in France with the 4th (Territorial) Battalion. On returning to England he took an active part in local Red Cross work, although he never altogether recovered from the strain imposed upon him by active service. His professional skill, sincerity, and kindly disposition were greatly esteemed by colleagues and patients alike. Dr. Berry was at one time a contributor to the columns of THE LANCET. He leaves a widow and one daughter.

THE LANCET.

LONDON: SATURDAY, JANUARY 6, 1923.

A CENTENNIAL YEAR.

DURING 1923 THE LANCET will complete 100 years of its existence. The first number appeared on Sunday, the 5th of October, 1823, and contained a prefatory statement to the effect that the objects of the new journal would be, primarily, "to produce a work that would convey to the public and to distant practitioners, as well as to students in medicine and surgery, reports of the metropolitan hospital lectures"; and, secondly, "to give a correct description of all the important cases that may occur whether in England or on any part of the civilised continent." And as though this programme was not sufficiently inclusive, THOMAS WAKLEY, the Founder, with the audacity of youth—he was 28 years of age—added to his intentions the following: "Our columns will not be restricted to medical intelligence, but, on the contrary, we shall be indefatigable in our exertions to render THE LANCET a complete chronicle of current literature." Those with access to the first number of THE LANCET in its original form may note with interest or amusement how far in the space of 36 small octavo pages it was attempted to keep the promises made.

The metropolitan hospital lecture selected for report was one delivered on the 1st of October, 1823, by Sir ASTLEY COOPER, and it is a good example of chatty exhortation to a medical school, the students present being described by the Editor (it may be feared with an eye on possible subscribers) in these words:—"We never before witnessed so genteel a surgical class; the sight was most pleasing, for they all appeared gentlemen of cultured manners and good education." A leading article succeeded entitled "Politics," whose medical interest is exactly nil, but the editorial opinion of the younger PITT as "an official coxcomb, regardless of everything but the gratification of his own senseless, remorseless, and petty ambition," indicates from what political sections of the public, whom he proposed to address equally with medical men, the Editor hoped to obtain support. PITT, of course, had been dead some years, but his name was used as a point of rally against Radicalism. Some notes on the drama were followed by three carefully written clinical cases from Newcastle-on-Tyne, from Lynn in Norfolk, and from Bedford, indicating the design to excite the interest of widely separated centres. Then came a long quotation, under the heading Medical and Surgical Intelligence, from the columns of the *London Medical Repository*. In this excerpt Mr. HENRY EARLE, assistant surgeon to St. Bartholomew's Hospital, carries on a controversy with Sir ASTLEY COOPER, as to whether fracture of the neck of the thigh-bone ever unites, and also as to whether COOPER had said that EARLE was maintaining the contrary view in order to depreciate Guy's Hospital and its teaching—for COOPER, while lecturer at St. Thomas's Hospital, was surgeon to Guy's Hospital. From the journalistic point of view there was considerable sagacity in publishing in the first number of the new medical paper, and in the front pages, an address by the acknowledged leader of surgery, while reprinting, as a quotation, a very civil but candid reflection upon his judgment. This article struck that note of criticism without fear of persons which the original WAKLEY intended should be characteristic of his venture, and which involved him in a group of libel actions for some ten years, in most of which he won actual or moral verdicts. The offer to supply a "complete chronicle of current literature" was met by quoting from the *London Magazine* a letter by "ELIA" to ROBERT SOUTHEY, whom the Editor of THE LANCET described as a "sack-hunting hypocritical rhymer," thus expressing the opinion of the Radical party upon the Poet Laureate, who had renounced the Republican and Unitarian views of his youth, to appear as a defender of the Established Church. A short paragraph, which promised mysterious revelations concerning a clergyman, led to the editorial request for certain information concerning that person, with which the number closes. Having regard to the direction which those revelations afterwards took, we cannot be surprised that in the second number the Editor of THE LANCET has changed his printer.

How far THE LANCET, as it now appears, differs from the journal in its first decade might be made the subject of self-congratulation in obvious directions, none of which we propose to take; and, while we may, or may not, regret, we cannot apologise for the absence from our pages to-day of the gay scurrility which enabled WAKLEY to command from the beginning a large audience for his projects of reform in the medical profession. We are more than content to believe that in essential design—namely, the desire to promote the cause of medicine and the interests of its practitioners—we have remained the same paper throughout the hundred years. We publish in another column a letter from Sir JOHN TWEEDY, whose personal recollections of THE LANCET go back to the day of its Jubilee; and a retrospect over our first fifty years, suggested by this letter, shows the manner in which the original policy expanded, the varying places in which it was justified, and the singleness of the essential design. The whole pattern of hospital training was altered during those fifty years in accordance with plans suggested or supported by writers in the editorial and correspondence columns of THE LANCET, or endorsed by those writers, often in a forcible fashion. Nepotism at the principal hospitals withered under this treatment, and the strictures were not confined to the leaders of the profession, for persistent exposure of the imperfect training which many medical men received was a powerful assistance to the passage of the 1858 Act of Registration. While the intention to appeal to the public directly was abandoned quite early, the purpose of this intention—namely, to effect sanitary and social reforms—was carried out by close inquiry into manifest abuses. From the beginning the claims of quack medicines were subjected to the chemical analysis of the day, and, when these methods were directed to the detection of food adulteration, a movement was started which led to the important legislation which we now possess. The part played by THE LANCET fifty years ago in the reform of workhouse infirmaries, and in the institution of Hospital Sunday, shows again the determination to prove the connexion between the public weal and the work of medicine. But we do not wish either to enumerate old exploits or recent developments and activities. It is more fitting that we should acknowledge a genuine feeling that nothing in those early days could have been done by this paper, as nothing can be done by us now, without the coöperation, intimate help, and valuable criticism of our public. One little blow of our own

trumpet we permit ourselves—we do not believe that our readers would have supported us through an unbroken century if they had not found us serviceable.

SYMPTOMATIC TREATMENT.

A SENIOR medical student not long ago achieved praise by the succinct tone of the following answer to an examination question: Ætiology—unknown; prognosis—doubtful; treatment—nil. He had indeed summed up with depressing accuracy many pages in many text-books recording unsuccessful attempts to elucidate the prime cause, the probable duration, and the proved cure of the rather uncommon condition named, and he deserved credit for a just résumé, which could have been an expression of nothing but industry, for without wide reading he would not have dared to assume that his answers were adequate. But in medical practice a less uncompromising attitude is necessary, while the problems presented by patients are not always of the concrete sort that can be so briefly dismissed. Assuming that this examinee had been asked to differentiate between possible causes of this condition, to mention points in history that might influence prognosis, and to recommend treatment in certain associated symptoms, he would have had much to say if he was really a well-informed person, and, especially under the third heading, he would have been placed somewhat in the position of the practitioner while arranging his replies. The practitioner may be unable to suspend operations until the most direct line of attack has been ascertained; he may have to advance somehow, if only by engaging hostile forces as and when these manifest themselves, and even when their immediate origins become clear the *causa causans* may remain obscure.

There is thus a difference in outlook and in responsibility between the research student and the practitioner, and undoubtedly this leads to difficulties in the professional training given at the medical schools. Some persons even contend that at the present day the training given bears but little relation to the daily work of the practitioner. A cogent answer to such criticism is that if the student in his early years is encouraged to think in terms of symptomatic treatment his ideals will never rise above this level. It is the duty of the teaching staff of a hospital to equip a practitioner with a just conception of the processes of disease as at present understood, and with a comprehensive, if somewhat dogmatic, knowledge of accepted therapeutics; and the standardised examinations of the universities and corporations should test the candidate on these points. He will then be found competent at diagnosing common ailments, medical and surgical, including some of the most important diseases and injuries, and he will be able from hospital training to estimate their urgency, and decide on their treatment. He may not, however, have close acquaintance with some of the things which are judged by the public as too trivial for hospital advice, and, alas, these will include the early manifestations of many important illnesses, and he will have had little opportunity for learning the reasons why he should vary therapeutic measures in many conditions which appear similar, or why he should adopt a particular course in a particular case. Only individual personal experience can make this side of his professional life easier, but where an individual patient is suffering from some serious disorder for which no specific remedy presents itself, it seems possible that he might get more help from his teachers and from medical literature than he receives at present. The impulse towards a more scientific conception of medicine has led to the dismissal of too many disorders in text-books with the curt advice to "treat the cause." But as "A Pathologist" acutely points out in our correspondence columns there is a kind of disease prevention—and a very important one at that—which has nothing to do with ultimate causes and which can be pursued with success in ignorance of them. Exact illustrations of this situation may be found in Dr. Fortescue Fox's address on the Breakdowns of Middle Life which is printed on p. 55. To-day it may be assumed as common knowledge that we must treat the cause when we see it, but if it is not manifest even after careful search, or if when found it is irremediable, much may still remain to be done by the medical practitioner.

A series of articles, contributed by invitation, will appear weekly in our columns, and will represent individual experience in the treatment of diverse medical and surgical conditions arising commonly or rarely in practice. Every practitioner is occasionally perplexed by patients who do not respond to the treatment he is accustomed to order, having found it successful in apparently analogous cases. Aural or vaginal discharge, subacute rheumatism, intestinal worms, neuralgia, sciatica, habitual constipation—all these are among the conditions which he may find intractable in patients of every class in life, and it is no reproach to him that he is not familiar with all the methods that have been adopted successfully for their relief, or certain which of these methods has the most direct applicability in a given case. Personal experience which would have stood him in good stead in five or six of the conditions we have enumerated may fail him in a seventh; his hospital training yields only generalities, while he knows that a new technique now holds the field; his text-books may be silent; and search through medical literature is laborious. To meet these circumstances, which our letter-bag shows to exist, we have asked the help of writers who enjoy peculiar opportunities for helping their colleagues.

NEUROSYPHILIS AND ITS PREVENTION.

THE solution of the problems presented by neurosyphilis and its treatment, attacked though they have been from every side during the last decade, has not yet been attained. We have no specific technique for treatment at all comparable in certainty of result to various antitoxin methods for some of the other infections, nor, for that matter, are we absolutely sure of our organism, as far as neurosyphilis is concerned. In his instructive address on modern methods of diagnosis and treatment of syphilis of the nervous system, which will be found elsewhere in this issue of THE LANCET, Sir FREDERICK MOTT argues for the existence of two varieties of spirochæte implicated in syphilis, the dermatropic and the neurotropic respectively. Notwithstanding the authoritative position of this eminent neuropathologist, which must lead us to weigh seriously his contentions, the actuality of these two distinct varieties is as much denied as accepted, and the evidence is still conflicting. The discovery of different strains of meningococcus has turned out to be of prime therapeutic significance in respect of the successful treatment of cerebro-spinal fever; by comparison, the indefiniteness of our knowledge of the *Spirochæta pallida* is a hindrance in the way of progress. Even though the assumption is made of one variety only, we are greatly in the dark as to its

life in the infected individual. How the disease may be transmitted from one person to another years after the former has passed what is ordinarily called the infective stage, and how the virus may on occasion remain quiescent for a quarter of a century or longer, to break out into pathogenic activity in the fullness of time, are questions beyond our answering. Thus therapeutic success is still delayed largely through ignorance of the biological characters of the organism with which we have to deal.

The fact, however, that an appreciable and sometimes a very long interval separates the original infection from late neurosyphilitic manifestations should in reality be taken as a blessing in disguise and an incentive to the prosecution of active treatment. Cases in which neurosyphilis makes its appearance within weeks or months of the date of the chancre are altogether exceptional. If, then, the risk has been run of the development of neurosyphilis, surely the plain duty of the individual and of his medical attendant is to ascertain whether the nervous system is involved or not, and this long before clinical symptoms and signs reveal the truth to the most superficial observer. Self-evident as this suggestion is, it is amazing to think how seldom it is acted on. At the disposal of the investigator are simple tests in blood and spinal fluid the import of which cannot be mistaken should they indicate failure on the part of the individual to eliminate the original virus. While perhaps less than 10 per cent. of syphilitics subsequently develop neurosyphilis, it should none the less be a paramount necessity for all who have contracted the disease to submit themselves to routine examination from the neurosyphilitic standpoint. Before the potential tabetic has his attention drawn to persistent "rheumatism" in his legs, before the potential paretic begins to act strangely or to show the faintest trace of dysarthria, there can be no possible doubt that serological and spinal-fluid tests would furnish precious information, and would serve to orient treatment in the appropriate direction. We associate ourselves entirely with the emphatic pronouncements of Colonel L. W. HARRISON, who in the excellent address on the treatment of the disease to be found in this number of THE LANCET once more urges on all concerned the imperative need of thorough treatment not merely in the first instance, but just as much when the only evidence of neurosyphilis is in positive bacteriological findings. Herein lies for the present our sole prophylaxis. We cannot inoculate against neurosyphilis, but, fortunately, we can detect meningeal and spinal-fluid reaction to the activity of the virus in the insouciant individual who has been assured by uninformed opinion that he is "cured" and can marry with safety.

The many ingenious methods devised in recent years for the treatment of established neurosyphilis scarcely represent more than belated efforts to combat an evil which should have been stamped out by intensive handling at a far earlier stage. Their multiplicity can only impress the thoughtful physician with their inefficacity. Doubtless the necessity for their employment will remain just so long as the candidates for neurosyphilis are beguiled into a false sense of security by the disappearance of their first clinical symptoms or by an ostrich-like policy of ignoring what they would rather not think about. It is admittedly difficult to persuade the man in apparently perfect health to undergo revision of his case from time to time. The facts, however, being as they are, the practitioner naturally wishes to know what is the best line to pursue in the treatment of neurosyphilis, and he can learn from a perusal of the two addresses already alluded to what those who are the masters of their subject advise. We confess finality is far indeed from being reached. In this connexion we should like to direct attention to the recently published volume[1] by Prof. WILHELM GENNERICH, of Kiel, on the causes and treatment of syphilis of the nervous system, a book rich in clinical information and deserving of an English edition. Prof. GENNERICH is an enthusiastic advocate of what he calls the method of "double puncture" in the treatment of the severe forms of neurosyphilis. His technique is approximately as follows. By spinal puncture distant two or more spaces from the usual site some 20 c.cm. of cerebro-spinal fluid are allowed to flow into a sterilised burette, which is then closed; into another burette attached to the needle at the ordinary site the rest of the spinal fluid is allowed to drain, 50 c.cm., or it may be considerably more, being thus withdrawn. In the first or upper burette a particular dosage of neosalvarsan in suitable solution is then placed and mixed, and the whole of the burette contents permitted to run back by gravity into the theca; finally, some 35–50 c.cm. from the second or lower burette are similarly run back, the idea being that this latter replacement of spinal fluid propels the salvarsan-containing part towards the upper spinal cord and cerebrum. Prof. GENNERICH claims for his technique superiority in results over all others. In not a few other respects his methods merit favourable consideration and are worthy of patient trial.

Some day unification of procedures will announce to the expectant physician that success has been attained and a specific cure devised. Until then we can hardly hope to escape from the necessity of "trying out" techniques as diverse as that outlined above and the Austrian one, to which Prof. A. PILCZ calls attention on p. 19, of utilising malaria-infected blood. Which, if any, of them all is likely to stand the test of time and pass the standard for percentage of cures it is at this stage impracticable to estimate.

HYGIENIC TRAVEL.

THE amalgamation, which takes place this week, of an immense number of competing railroad managements into a few well-distributed groups has given rise to new prospects of efficiency. For ourselves we entertain the hope that travel may not only be rendered hygienic, but may increasingly become an object-lesson in the essentials of health to the travelling public. At the present time the sanitary conveniences of the large railway stations in London and the great cities, although they lack the charm of, say, Aberdeen or Basle, are nevertheless clean and efficient; but the water-closets and urinals of most suburban and rural stations are unclean and inefficient—in many cases stronger terms would be appropriate—while the facilities for women are penurious. Waiting-rooms, if not warmed, should at least be clean, and we may hope that a time will come when it will be possible for any adult traveller to wash his hands at a railway station and for any child to obtain a drink of clean water. Much, of course, depends on the coöperation of the travelling public, but railways have already done a great deal to discourage the ugly habit of expectoration; travelling manners are improving and the companies should maintain their lead. Our Roumanian correspondent tells us that the sanitary board of the State railways is setting up certain standards regarding ventilation and cleanliness in consultation with members of the medical profession. Perhaps the Royal Sanitary Institute or the Royal Institute of Public Health could initiate some rivalry among the railway directors in these matters, for undoubtedly hygienic travel might be made a valuable object-lesson.

[1] Syphilis des Zentral-Nervensystems: ihre Ursachen und Behandlung. Berlin: J. Springer. 7*s*. 6*d*.

Annotations.

"Ne quid nimis."

NEW YEAR HONOURS.

FIVE knighthoods for distinction in medicine make a good show in a list which records few political honours. Prof. David Drummond, who is pro-vice-chancellor of the University of Durham, presided with dignity at the Newcastle meeting of the British Medical Association last year. Dr. William H. Hamer, principal health officer to the County of London since 1912, has not allowed onerous routine duties to dull his zest for epidemiology or his initiative in fruitful hygienic research over an immense field. Dr. Bernard H. Spilsbury, during his tenure of office as senior pathologist to the Home Office, set a standard for expert evidence which contributed notably to the administration of justice. Dr. Norman Walker's wise guidance to the Scottish Board of Health, his assistance to medical recruiting during the difficult years of the war, and his recent service to medical education in India formed severally a strong claim to public recognition. Dr. George Cuscaden, of Melbourne, is honoured for his labours as Director-General of Australian Army Medical Services. In the Royal Victorian Order, Sir Milsom Rees, C.V.O., becomes K.C.V.O. In the Order of the Bath (Military Division), Surg. Rear-Admiral Jonathan Shand is appointed C.B., and Major-General Sir William Rice becomes K.C.B. In the Order of the Bath (Civil Division), a companionship falls to Dr. F. J. H. Coutts, a senior medical officer to the Ministry of Health. In the Colonial Office List, Dr. C. A. Wiggins, P.M.O. of Uganda Protectorate, becomes C.M.G., Dr. Henry Curwen (Zanzibar) and Dr. W. McN. Muat (Weihaiwei) become C.B.E., and Dr. Herbert Torrance (Palestine) O.B.E. Mr. H. P. Pickerill, L.D.S., also receives the C.B.E. for service in connexion with jaw operations on wounded soldiers in New Zealand. In the Order of the Indian Empire, the following appointments are announced:—K.C.I.E.: Major-General G. G. Giffard; C.I.E.: Lieut.-Colonel J. P. Cameron, Lieut.-Colonel Henry Ross, and Lieut.-Colonel Alfred Hooton. Sir Havelock Charles receives a knighthood in the Order of the Star of India. Kaisar-i-Hind medals are awarded to Dr. Robert Harper (American Baptist Mission, Burma), Dr. Isabel Carr (Leper Home, Hyderabad), and Dr. N. N. Parakh (Burma). Further appointments of O.B.E. (Military Division) are those of Major W. B. Purdon, R.A.M.C., and Major H. T. Stack, R.A.M.C. In fields nearly akin to medicine, a knighthood has been conferred upon Mr. Basil Clarke, Director of Public Education at the Ministry of Health, and a K.B.E. upon Prof. D. O. Masson, D.Sc., of Melbourne. Miss Helen Iles, acting matron of the New General Hospital at Bagdad, becomes M.B.E., and Sister Annie Blanche, of the Presidency General Hospital, Bengal, receives the Kaisar-i-Hind medal. To the recipients of all these well-deserved honours we offer sincere congratulation.

TOPICAL IMMUNISATION.

THE teaching that in certain diseases susceptibility and immunity are characteristics not of the body as a whole, but of certain organs, is reviewed by Prof. A. Besredka of the Pasteur Institute in the *Paris Médical* for Dec. 2nd. This teaching is, of course, not wholly new. Its importance has, however, been greatly enhanced by recent observations which not only throw light on the processes of ordinary vaccination against small-pox, but also suggest new lines of research in such diseases as Mediterranean fever and other infections. The typhoid-dysentery-cholera group are examples of "organ receptivity." If, for example, Shiga's bacillus is injected into a rabbit's vein, and the animal succumbs to the infection, cultures from the blood, urine, and all the organs except the intestines will usually prove negative. The intestines, however, which usually contain a very mixed flora, are found to harbour only Shiga's bacillus. The same thing happens when Shiga's bacillus is injected subcutaneously, and if this bacillus is killed by heat or antiseptics, and then injected into a rabbit, the intestinal mucosa shows the turgescence and dilatation of its blood-vessels characteristic of infection with the living organism. The question naturally arises: Is the efficiency of vaccines prepared from bacilli of the Shiga group really due to the formation of antibodies and the like throughout the body? Is it not more probable that these vaccines create a local intestinal immunity by coming in direct contact with the organ for which they have a peculiar affinity? If this is so, why vaccinate the intestine by such a roundabout route as that entailed by hypodermic injection? In giving vaccines by the mouth, Prof. Besredka has found it necessary in the case of the typhoid-cholera group to give bile in advance, so as to render the intestinal mucosa sufficiently receptive. Vaccines from the Shiga group do not require such preliminary treatment. As antibodies are not demonstrable in animals immunised by the oral administration of vaccines belonging to the typhoid-dysentery-cholera group, it would seem that acquired immunity to the diseases of this group is a matter of local vaccination and nothing more. The theory of "organ receptivity" promises to provide a successful solution to the problem of vaccination against anthrax. In this disease the receptive organ appears to be the skin. If anthrax bacilli are introduced into the trachea, peritoneal or pleural cavities of a guinea-pig, it survives. But if its skin be but lightly infected the animal dies. When it dies after deep injection the skin has been contaminated in the process. Prof. Besredka has recently succeeded in rendering guinea-pigs immune to anthrax by anthrax vaccines introduced into the skin, and he hopes to prove that even the most susceptible mouse may have immunity conferred on it to certain diseases by cuti-inoculation. May not, Prof. Besredka asks, the success achieved by Sir Almroth Wright in the vaccine treatment of staphylococcal infections be due to cuti-inoculation? One result of this most interesting teaching must be that in the future we shall ask: Is such and such a disease characterised by "organ receptivity?" If it is, the next step is to get this receptive organ into as close contact as possible with the corresponding vaccine. Prof. Besredka suggests that, if his teachings are confirmed, intra-, not subcutaneous inoculation will be indicated in certain diseases.

UNDERWEIGHT AND OVERWEIGHT.

A RECENT statistical bulletin of the Metropolitan Life Insurance Company of New York sets out the experience gained by insurance companies in assessing the relation of body-weight to longevity. Overweight is generally admitted to be a serious impairment among insured lives, its gravity increasing in proportion to the excess in weight over the average for height and age. At the younger ages there is, however, a trifling exception, for then a limited amount of overweight is apparently an advantage; such young heavy persons have uniformly a lower death-rate from tuberculosis. After the age of 35 overweight, even in relatively small amount, begins to be dangerous. Among short men—that is, those below 5 ft. 7 in. in height, at the age-period of 40–44 years an excess of 20 per cent. in weight involves an added mortality of 30 per cent. above the normal. Turning now to the other side of the picture, under most conditions underweight is an advantage, except in early adult life among the taller men. To be over 5 ft. 10 in. high and 30 per cent. underweight brings 50 per cent. increased risk, but from the age of 40 onward underweight becomes a distinct advantage, and those who weigh between 10 and 20 per cent. below the average show the optimum condition of longevity. Average build, in truth, is not the best build, and statistical findings confirm the common observation that a large majority of our acquaintances who reach a ripe old age are of slight build. The

New York bulletin omits to mention two points to which great attention is paid in life insurance work in this country—namely, family precedents in respect of bulk and the relation of chest measurement to abdominal girth. It is almost a commonplace of insurance experience that large persons more often succumb at an earlier age to disease of heart or kidneys, to pneumonia, or to disorders which suggest the wearing out of machinery in the body. To discover a reason for this would be a fitting problem for the physiologist.

TRANSPLANTATION OF THE LIVING EYEBALL.

IN July last Dr. Koppanyi reported that he had been successful in transplanting living eyeballs in fishes and other lower vertebrates, and the Biological and Ophthalmological Societies of Vienna appointed a joint committee to study the problem thus raised. At a recent meeting of these two societies in the first Vienna eye-clinic reports were received on experiments conducted independently by several scientists. There was remarkable difference in the interpretation of these reports. Whilst the ophthalmologists stoutly denied that the experiments bore out the statements of Koppanyi, the physiologists and biologists present insisted on the possibility of successful transplantation. Dr. Quist, of the eye-clinic, stated that the eyes transplanted by him were soon subject to retrogressive metamorphoses: but he admitted that important structures, including the optic nerve and connective tissues, survived for months, although other parts of transplanted eyes lost their vitality completely. Prof. Przibram pointed out that in theory there was no reason why such transplanted eyes should not be made to function; re-union of a divided optic nerve was certainly nothing unexpected. Prof. Kolmer reported on a successful transplantation of an eye in a rabbit, but his confirmation of the experiments of Koppanyi was not regarded as convincing. Prof. Meller, director of the eye-clinic, considered the negative results of Quist's experiments to show the futility of Koppanyi's method, although it was pointed out with some force that any number of negative experiments could not deprive even a single positive result of its value.

IMPECUNIOUS STUDENTS ABROAD.

THE welfare of the student, especially of the medical student, is a matter of general concern. In many countries the difficulty of securing a sufficient number of medical students to supply the wants of the community is causing considerable anxiety. The cost of all commodities, and the difficulty of earning a living since the war, have compelled many parents to abandon the hope of giving their children a professional education. Others have made the attempt, but under such straitened circumstances that in not a few cases the health of the students has been injured for want of suitable food and lodging. It has recently been insisted, in a periodical entitled *l'Université de Paris*, that in France the measures taken to meet these difficulties are altogether insufficient. The cost of provisions and of rent has so increased that many students have abandoned all hope and left their universities. As matters now stand, a student in Paris must spend from 7000 to 8000 francs a year, which, according to the more recent fluctuations in the value of the franc, may mean anything from £114 to £160 a year. Though these figures apply to British students at Paris University the sacrifice is more considerable for French students in view of the depreciation of the franc. There exist, of course, various forms of assistance, such as coöperative restaurants where very cheap meals can be obtained; but a coöperative hostel with clean but cheap sleeping accommodation is even more necessary. Some students, to make ends meet, give lessons and get other work, but the strain of earning money and preparing for examination often proves too much, and their health breaks down. Others have won scholarships, which are, of course, of great assistance. In Belgium, Switzerland, and Czecho-Slovakia what is known as the *prêt d'honneur* is widely applied, and this system has become customary on an extensive scale in the Scandinavian States. It consists of a loan to the student which he cannot legally be forced to repay, and is not expected to repay unless he succeeds in passing his examinations, and, armed with his diploma, is able to earn his living. Then, solely as a matter of honour, he is expected to refund the money lent to him; it is gratifying to know that in most cases the money is repaid. As might be expected, the money comes from different sources. In Belgium a law, dated Nov. 11th, 1921, allows each province to create a fund for the assistance of students, and the Labour University of Charleroi has a special fund of its own for the purpose of granting such loans of honour. Then many voluntary subscriptions have been organised, prominent among them being the British Relief Fund, raised during the war, from which the University of Brussels derived very great benefit. The Swiss universities of Neuchâtel, Berne, and Zurich have loans of honour funds maintained by private subscriptions; in Czecho-Slovakia, as in Belgium, local authorities are authorised to raise the necessary funds, and the system has now worked very well for four years. In the Scandinavian countries considerable sums have been lent in this way, and no interest is charged. On the other hand, one or more signatures are required from persons of good repute who are willing to vouch for the student's good character. In France, a clause in the Budget of Dec. 31st, 1921, authorises the principle of loans of honour, but gives no details as to how the principle is to be applied. Still, for some years such loans have been granted on a small scale, notably at the École Centrale in Paris. The repayments are made so regularly that there are no complaints. It must, of course, be understood that such loans can only be made to promising students, the basic principle being that it would be a public loss if their studies could not be concluded. As a country has everything to gain from helping those who are likely to render valuable public service, a call can be made upon public funds for contributions towards the comparatively small expense involved. These considerations apply more especially to countries in which medical students are falling off in numbers, while their future services are indispensable.

"GENTLING" AND THYROID OPERATIONS.

PATIENTS with hyperthyroidism are generally in a fuss, and Prof. Crile has shown how the notorious dangers of thyroid operations in exophthalmic goitre may be minimised by careful psychical preparation of the patient. By getting the patient used to hospital and the paraphernalia of white coats and instruments, by daily practice with an anæsthetic mask, and so forth, Prof. Crile and his colleagues in Cleveland have reduced the mortality of thyroidectomy to about 1 per cent. in some 2000 cases. It is interesting to see that Dr. F. S. Hammett [1] in Philadelphia has quite independently come across the same phenomenon in rats. Studying the fatal incidence of acute tetany after the removal of the parathyroids, he found curious variations in the results, which were traced to the fact that the operated animals had come from two separate groups of rats. In one of these the animals had been petted and gentled and were continually in contact with human beings; they were not easily frightened, gave a uniform picture of placidity and had a mortality after parathyroidectomy of 13 per cent. The other group had had no more attention than is involved in ordinary cleaning and feeding; they were timid, apprehensive, and highly strung, gave a picture of constant high irritability, and had a mortality of 79 per cent. A third series of

[1] American Journal of Physiology, vol. lvi., 1921, p. 196; Endocrinology, vol. vi., 1922, p. 221.

animals bred from wild brown rats were untamed, excitable, and pugnacious, and 90 per cent. of them died. Of the facts there is less doubt than about their interpretation. Dr. Hammett supposes that the more excitable animal has higher neural and muscular tension, greater instability, larger production of toxic by-products (possibly of the nature of methyl-guanidine and connected with creatine) and hence a greater need for the parathyroids to avert disturbances arising from these sources. But even if this is not the explanation, it is evident that "gentling" is an experience which would do many people good.

OPERATIONS AND THE PATIENT'S CONSENT.

INSTANCES in which a conscious patient undergoes an operation to which he has not consented are so rare that the following case is of interest as well as of legal importance to the medical profession. In the *South African Medical Record* of Nov. 25th is reported a case heard in the Cape Provincial Division of the Supreme Court before Mr. Justice Watermeyer and a jury, in which £10,000 damages were claimed from Dr. C. C. Elliott, a well-known Cape Town surgeon, for amputation of the penis without the consent of the patient, and, alternatively, for performing an unnecessary operation. The plaintiff, a man aged 50 years, was admitted to the New Somerset Hospital, Cape Town, suffering from gangrenous ulcer of the penis. After a careful examination by the defendant, who is visiting surgeon to the hospital, and by Prof. G. B. Bartlett, of the University of Cape Town, who is pathologist to the hospital, it was decided that the patient was suffering from cancer and that to save his life the penis should be amputated. This was done, but the plaintiff stated that he consented to operation only under the idea that a circumcision was to be performed. He saw a report in which Prof. Bartlett recommended that the growth should be treated as "malignant," but he did not know what this meant. Some medical evidence was given for the plaintiff throwing doubt on the diagnosis of cancer and suggesting that, in any case, radium or X rays should have been tried before proceeding to amputation. Dr. Elliott in his evidence stated that he had had a good many similar cases, and had given this one much thought and research, looking up authorities. In his opinion, X ray or radium treatment would have been not only inefficient but dangerous. It was the duty of the house surgeon to obtain the consent of the patient, and he assumed that this had been done. The only responsibility he took was with regard to the operation. He took none with regard to obtaining consent, which was an administrative matter. The house surgeon explained that, as the patient was transferred from one ward to another in preparation for operation, he unfortunately assumed that his consent had been obtained. Prof. C. F. M. Saint gave evidence that, on Prof. Bartlett's report, amputation was the proper treatment. Since this case the hospital had adopted a printed form which must in all cases be signed by a patient giving consent before an operation. In summing up the judge said that a man did not waive control over his body by going into hospital, and that consent for operations should always be obtained, as admitted by the defence. In this case it was not obtained by an oversight, and the question arose, who was responsible? It was clear that no moral responsibility attached to Dr. Elliott, who was justified in assuming that consent had been obtained. But that did not affect the legal position, for if an assault had been committed, it did not matter whose duty it was to have asked for consent condoning that assault, everybody concerned being equally liable. When it came to damages the jury would have to consider, first, whether the patient was suffering from cancer; next, was the operation necessary to save life? If these two questions were answered in the affirmative, they would have to consider whether the patient had suffered any damage at all. The jury, by a majority of six to three, returned a verdict for the defendant, for whom judgment was given with costs. We congratulate Dr. Elliott on the result, but the case has an important moral. The surgeon should always make sure that consent for an operation has been secured.

A CHILDREN'S BENEFACTOR.

A NATIONAL and representative committee is arranging to celebrate Sir William Purdie Treloar's eightieth birthday, which occurs on Jan. 13th. Treloar entered the paternal carpet business on Ludgate Hill at 15 years of age, became foreman in the Southwark factory, and travelled for the firm. He was elected to the Court of Common Council in 1881, joined the Court of City Aldermen in 1892, was a Sheriff of London in 1899, Lord Mayor in 1906–7, and is now the Father of the City Corporation. He was known as the "Children's Lord Mayor," for he gave as his sole reason for accepting the mayoralty his wish to help London children. In 1893 he began by sending hampers at Christmas time to small cripples, and now 5000 of such hampers are distributed annually. Realising that nine-tenths of the crippledom of this country is caused by tuberculosis, engendered by bad air, bad food, and the terrible surroundings of London slums, he vowed to establish a hospital for tuberculous crippled children and determined to collect for the purpose £60,000 during his mayoral year. In this he was successful, the City Corporation itself giving £1000 to the foundation. The Princess Louise Hospital at Alton, no longer required for the treatment of soldiers wounded in the South African War, was made over to Treloar and other trustees by special Act of Parliament. Treloar paid visits of inspection to Berck-sur-Mer and to the hospitals at Charlottenberg, and on Sept. 7th, 1908, the first patient arrived at the Lord Mayor Treloar Cripples' Hospital and College. Since then 2400 children have passed through the wards cured, and more than 300 older lads have completed a three years' course of training in boot-making, leather-work, or tailoring. A new seaside branch has now been founded at Sandy Point on Hayling Island, where the child's metabolism can be raised if necessary to ten times its normal intensity. Treloar's ambition to keep abreast of modern discovery in the treatment of surgical tuberculosis has been fully realised, and Alton methods have become the model for similar treatment elsewhere. Alton is, in fact, the realisation of the dreams of an alderman on Ludgate Hill and will be an abiding monument to him. The Earl of Balfour is chairman of the Tribute Committee, of which the hon. secretary is Mr. Percy Armytage, C.V.O., 33–34, Mansion House Chambers, London, E.C. 4.

STUDIES IN ETHER ANÆSTHESIA.

AN essay, showing signs of prolonged and careful research, has recently been published by Dr. Karl Gramén,[1] of Stockholm, and his work deals with about 700 quantitative analyses of ether in the expired air and in the tissues of persons undergoing ether anæsthesia. He has come to certain practical conclusions with regard to the best methods for counteracting the effects of this anæsthetic, and while some of his conclusions may be regarded as unorthodox, others are confirmatory of reforms which have already been introduced by certain anæsthetists. Using a modification of the bichromate test for the quantitative analysis of ether in the tissues, he found that in the course of 10 to 12 minutes the ether content of the blood rises to about 80 mg. per cent., and remains at this level with only slight variations during the rest of the narcosis. After its completion the ether content of the venous blood falls rapidly during the first

[1] Untersuchungen über den Aethergehalt in Blut, Milch, Harn und Expirationsluft bei chirurgischer Aethernarkose sowie über Narkoseazidose. Supplement to Acta Chirurgica Scandinavica, 1922, lv., pp. 146.

15 minutes, in the course of which it is reduced by nearly 50 per cent. The elimination of the ether proceeds more and more slowly, taking one to two days. While the patient's age and health do not affect this process, its rate varies directly with the duration of the narcosis. It has been customary to interdict suckling for a considerable time after a nursing woman has been operated on for fear of the ether in her milk proving injurious to the infant. The result of this practice is that the supply of milk is often permanently reduced, and though Dr. Gramén's investigations show that the ether content of the milk is approximately that of the blood, he has come to the conclusion that an infant may safely be put to the breast two hours after the completion of narcosis. Of special and personal interest to anæsthetists is his observation that after the completion of a narcosis of average duration, the air expired by the anæsthetist during two minutes contains one drop of ether. With only one exception an increase of β-oxybutyric acid in the blood during narcosis was found, and among non-diabetic patients ketonuria was found in 9·9 per cent. before narcosis and in 67·7 per cent. after it. Ether evidently induces achylia, and of 21 samples vomited during narcosis as many as 15 gave a negative HCl reaction, which was faint in the remaining six. All the 12 samples vomited after the narcosis gave a negative HCl reaction. To counteract this condition Dr. Gramén recommends the administration of lemon juice or 10 drops of HCl to a tumbler of water. He is opposed to the old practice of pre-operative purgation, and instead of draining the body of its fluids he flushes it with water a few hours before the operation. Glucose and normal saline enemas may, in certain cases, be no better than a plain water enema, for glucose may provoke excessive fermentation and colic, and in cases of renal insufficiency the absorbed saline solution may embarrass the action of the kidneys.

THE INFECTIVITY OF WHOOPING-COUGH.

THE period during which a child suffering from whooping-cough is a source of danger to others, and the possibility of the occurrence of carriers of the infection, are questions of great practical importance in home and school hygiene. The usual working rule is to isolate a case of whooping-cough for six weeks or even longer if the whoop persists, but it is possible that close adherence to this rule may involve unnecessary economic loss. It has been suggested from time to time that the infectivity of whooping-cough is at its maximum during the initial catarrhal stage when the nature of the malady is at most suspected, and that when the characteristic whoop has developed the child, although usually strictly isolated, is then no longer a source of danger to others, at any rate after the second or third week. The occurrence of mild and atypical forms in which the whoop never develops, increases the difficulty of tracing the source of infection in a household or school. Fresh evidence on these matters is offered in a recent article by MM. H. Barbier and Renard in the *Bulletins et Mémoires de la Société Médicale des Hôpitaux de Paris* (Dec. 7th, 1922). These authors relate how they obtained the Bordet-Gengou bacillus in pure culture from the brother of a fully developed case of whooping-cough. In this instance the boy from whom the bacilli were obtained had nothing but a cough, whereas no bacilli could be isolated from the recognised sufferer from the disease. The bacillus was detected by means of making the suspect cough upon a medium of glycerinated potato contained in a Petri dish; and, further, the contact who was thus disseminating Bordet-Gengou bacilli did not develop a whoop. Similar instances may be met with in adults, and as an example there is quoted in the same article the experience of Delcourt at a school in Brussels, where it was found that one of the mistresses, who had a persistent cough, gave a positive complement-fixation test for whooping-cough, and presumably accounted for the continuance of the disease in the school. In accordance with these views children in Denmark who have had whooping-cough are allowed to return to school four weeks after the whoop has commenced, even if it still persists. Whooping-cough is one of the most fatal of infectious diseases for infants, and any means which may lead to the checking of the spread of an epidemic or to the detection of its source is worthy of serious consideration. At this season of the year children's parties are no doubt responsible in part for the dissemination of infectious disease, and the possibility that apparently unaffected contacts may themselves be infectious is a practical point which should be borne in mind by the school and family practitioner.

STATE AID FOR TUBERCLE IN SWITZERLAND.

THE Swiss Federal Council reported last month on the distribution of the sum of one million francs (about £45,000) which it had been authorised to spend during the year 1922 for the care of tuberculous patients. The expenditure took the form of subventions to hospitals, dispensaries, sanatoria, and open-air schools, the amount never exceeding a quarter of the total outlay of these institutions. Set out in tabular form the distribution was as follows:—

Institution.	Sums from private sources.	State aid.
	Frs.	Frs.
67 local dispensaries	1,625,000	469,000
38 sanatoria for adults	4,480,000	341,000
18 sanatoria for children	815,000	96,000
8 day schools in or near forests ..	105,000	12,000
47 private hospitals with wards for tuberculous patients	1,000,000	74,000
Total	8,025,000	992,000

A special Federal law is now being drafted to combat tuberculosis on a larger scale. This will be presented by the Federal Council to the Assembly in the course of the present year.

VACCINATION IN MADRAS.

THE dissatisfaction felt by the Government of Madras with the manner in which vaccination is organised and carried out in the city of Madras, indicated in the Indian letter which appeared in our issue of Nov. 18th, 1922,[1] is again expressed in the Madras Vaccination Report for 1921–22. In the course of their order recording the report, the Government observe that the salient factor of the year's record is the rise in the rate of success in primary vaccination, on account of (*a*) the cessation of routine examination during the months of hot weather, and (*b*) the improved potency of the lymph supplied. The Director of Public Health to the Presidency has called attention to the relation between the incidence of small-pox and the number of vaccinations affected. Whenever an epidemic breaks out, vaccination booms. The disease subsides, apathy supervenes, vaccination is neglected, the number of unprotected persons increases, and in four or five years the population is ripe for another epidemic. Towards the end of the year under review Madras was visited by one of the worst epidemics of small-pox ever experienced in the city. During the same period vaccination has nowhere kept pace with the "available" birth-rate; the qualifying adjective calls to mind the fact that in the report of the Director of Public Health issued in June, 1922, the opinion was strongly expressed that the whole registration of vital statistics was worse done in Madras than in any province in India, although in fairness it should be added that the census officer's conclusion was not equally condemnatory. The tone of the Government Order relating to the vaccination report is one of disappointment with the work of local bodies. The indifference of these bodies to vaccination is only too evident from an

[1] THE LANCET, 1922, ii., 1088.

analysis of the report. No less than 60 out of the 80 municipalities showed a deterioration of work as compared with the previous year. The Director of Public Health gives two reasons for this discreditable performance. "It will be impossible to improve the personnel of vaccinators," he says, "unless local bodies make up their minds to pay them adequately or to give them at least a living wage." There is no dearth of candidates, but "the low pay offered makes the posts unacceptable to any but the incompetent." In the second place, the Revenue authorities and the magistracy should realise their responsibility and show a more sympathetic attitude towards the vaccination staff. It is ridiculous, for instance, that an armed Mahommedan should be able to assault a vaccinator in the discharge of his duties and then be let off with a fine of Rs.25. As the Government Order says, "it is useless for the King Institute and the vaccination staff to do their best in what is after all a mission guaranteeing the safety of the entire Presidency, if local bodies themselves refuse to profit by the labour and guidance of these authorities."

COMMON ERRORS OF DIAGNOSIS IN ACUTE INFECTIOUS DISEASES.

IN the instructive series in course of publication under the editorship of Prof. J. Schwalbe of Berlin on diagnostic and therapeutical errors and their prevention, a special volume[1] has recently appeared on acute infectious diseases in childhood written by Dr. H. Kleinschmidt, director of the Hamburg University Children's Clinic. The diseases discussed are the commoner infections, which are classified in four main groups, according as the respiratory organs (pertussis, influenza, diphtheria), alimentary canal (enteric, dysentery, mumps), or nervous system (tetanus, cerebro-spinal fever, Heine-Medin's disease) are chiefly affected, the fourth group consisting of the acute exanthemata. In his introduction Dr. Kleinschmidt emphasises the fact that with the onset of an acute infection children are very liable to develop gastro-intestinal symptoms, so that the occurrence of vomiting, refusal of food, and, especially in young children, diarrhœa may lead to a mistaken diagnosis of gastro-intestinal catarrh. A careful examination of the whole body should therefore be carried out before such a diagnosis is made. In particular, inspection of the throat and testing the urine should never be omitted. The conditions most likely to be mistaken for pertussis are simple catarrh in a spasmophilic child, and spasmodic cough due to glandular tuberculosis or epidemic influenza. On the other hand, abortive or atypical cases of pertussis, which are apt to occur in the first months of life, often fail to be recognised. One frequently finds in family practice that the mother or servant is the first to develop an attack and to infect the children. The diagnosis of influenza, Dr. Kleinschmidt remarks, is only too readily used as a cloak for the practitioner's uncertainty of diagnosis. The principal diseases which must first be excluded are tuberculosis, typhoid fever, and acute leukæmia. The frequent occurrence of morbilliform and especially scarlatiniform rashes in influenza may also be misleading. While admitting that errors of diagnosis in diphtheria are sometimes inevitable, owing to the atypical character of the attack or unusual localisation of the process, Dr. Kleinschmidt maintains that they are most frequently due to failing to examine the throat. It is through such a sin of omission that many cases of diphtheria are at first treated as mumps—a point, curiously enough, not mentioned by the writer—and it is not until an advanced stage, when antitoxin is powerless to arrest the disease, that its true nature is recognised. At no age is enteric fever so likely to be overlooked as in infancy, when, owing to the irregular and often remittent type of fever and the absence of pea-soup stools it is liable to be mistaken for a febrile intestinal catarrh. It is therefore advisable to make a bacteriological examination of the blood in every febrile disease in infancy which does not show the characteristic features of alimentary intoxication or meningitis. In discussing the diagnosis of scarlet fever Dr. Kleinschmidt again insists on examination of the whole of the body, for it is through neglect of this simple precaution that numerous errors of diagnosis have been committed, special attention being paid to the inner side of the thighs, Scarpa's triangle, and the inner side of the upper arms. In rudimentary cases of scarlet fever these sites alone may be affected, and it is therefore not sufficient to examine the chest only for the presence of a rash. In the section on measles the writer emphasises the importance of examining the mouth in every febrile disease of children, for the presence of Koplik's spots, as well as for the measles enanthem, which consists of irregular, dark-red patches on the soft and hard palate. The difficulties of diagnosing non-eruptive measles, of which an example was recorded in THE LANCET many years ago by Dr. J. D. Rolleston,[2] are also discussed. Like most physicians, with an extensive knowledge of the acute exanthemata, Dr. Kleinschmidt does not believe in the existence of the fourth disease, as described by Filatow and Dukes. On the other hand, he maintains that erythema infectiosum, which is apparently unknown except in German-speaking countries, is more deserving this title. In dealing with erysipelas, Dr. Kleinschmidt draws attention to the frequency with which beginners mistake the erythematous zone which normally appears round the vaccine vesicles between the seventh and eighth days for erysipelas—an error particularly to be avoided at the present time when vaccination is being performed on an extensive scale in this country. In the section on Heine-Medin's disease Dr. Kleinschmidt draws attention to the occurrence of rashes in the prodromal stage, and points out that the former belief that acute anterior poliomyelitis was a frequent sequel of measles or scarlet fever has been abandoned in favour of the view that scarlatiniform or morbilliform eruptions may be associated with infantile paralysis.

[1] Diagnostische und Therapeutische Irrtümer und deren Verhütung: Kinderheilkunde. Akute Infektionskrankheiten m Kindesalter. Leipzig: Georg Thiemer.

PRIMITIVE BACTERIOLOGY.

IT is debated whether the ancient Hindus or the Chinese were the first to excogitate from their inner consciousness the existence of bacteria. There is no claim, we believe, for any earlier guess-work. In the Vedantic writings there exist representations of germs or microbes, and these at some remote date were copied into the Batak manuscripts of Java. The pictures in these manuscripts, which may be seen in some Oriental libraries, are painted upon bark and resemble the dashes, dots, loops, and twists of a large and loosely written shorthand. The dates of the MSS. and their Vedantic source must be very ancient, but no exact evidence on the point is forthcoming. More definite is the news from the China of the period of the Anglo-Saxon Heptarchy, which now comes to us in the pages of "Myths and Legends of China," the author of which, Mr. Chalmers Werner, of Pekin, is one of the most learned of living Sinologists. This fine work, published in the course of last year by Harrap and Co., contains a very interesting section entitled Myths of Epidemics, in which we have an illustration representing "the plague-disseminating umbrellas." These umbrellas, which are of the familiar Chinese kind, are being floated into the air by Lü Yüeh, President of the Ministry of Epidemics, and in private life an old Taoist hermit. He stands on the wall of a fortress, a bearded figure, for in these antique Chinese illustrations most of the male personages are bearded, robust, and resembling facially the hairy Ainus of Japan. His pleasant purpose in floating the plague-disseminating umbrellas into the air is to infect the mythic hero Yang Jên, who has deeply offended him in his official capacity as minister

[2] THE LANCET, Dec. 10th, 1904, p. 1640.

of health. "But the latter (Yang Jên)," says Mr. Chalmers Werner, "simply by waving his fan, reduced all the umbrellas to dust, and also burned the fort, and with it Lü Yüeh." The picture represents Yang Jên waving his fan, while clouds of large comma-like or horseshoe-like objects float from the umbrellas towards him. We dare not suppose that the Chinese knew the microscope or the magnifying glass, though so many modern Western inventions in some form or other had been forestalled by their ingenuity. The microbes, as figured, none the less are singularly like certain bacteria as seen under the microscope. In the China of this date five Gods of Epidemics were believed to exist, while the chief God of Medicine, Fu Hsi, was a mythical king. He had six hands, in which he held plague germs, the plague flag, and the plague sword. His date is given as about the year 599 A.D.,[1] and we imagine it to be also the date of the umbrellas. Mr. Werner cites the Jesuit Père Henri Doré as one of his chief authorities outside the innumerable Chinese MSS. which he has consulted and lived among since leaving Tonbridge School more than 40 years ago.

BISMUTH AS AN ANTILUETIC.

IN a special number of the *Paris Médical* (Dec. 2nd, 1922), devoted to recent advances in therapeutics, Dr. E. Émery and Dr. Alexandre Morin, of the Saint Lazare Infirmary, Paris, remark that the most interesting therapeutical acquisition within the last few months is the use of bismuth in the treatment of syphilis. This is not an absolute novelty, since it had been employed by Balzer at the Lourcine Hospital in Paris as long ago as 1888, but it was only after the work of Saverac and Levaditi in 1920, following that of Sauton and Robert in 1916 on its use in trypanosomiasis and spirilloses, that bismuth became generally recognised as an anti-syphilitic drug.

Investigations of numerous observers, especially those of Saverac and Levaditi, have shown that whatever method of administration or preparation of bismuth is employed, the active substance is metallic bismuth. Its mode of action therefore more closely resembles that of mercury than that of arsenic. In the course of its administration bismuth becomes widely disseminated throughout the organism, chemical analysis having shown it to be present in the blood, cerebro-spinal fluid, and almost all the organs, especially the liver, salivary glands, heart, and spleen. It has been detected in bile, urine, saliva, sweat, and fæces, in all of which it is rapidly eliminated. When used in suitable doses bismuth preparations have been found to be very active in all stages of syphilis, excluding parasyphilis. In the primary stage the time which the chancre takes to heal varies according to the size of the lesion; on the average it is 13 days with 4 injections, but it may be as short as 4 days with a single injection, or as long as 25 days with 8 injections. In the secondary stage the cure of mucous tubercles and oozing cutaneous surfaces takes place rapidly, and is effected on the average in 11 days with 3 or 4 injections. Émery and Morin agree with Clément Simon and Bralez in regarding the action of bismuth as far superior to that of mercury, and comparable to that of large doses of arsenobenzene. The same is to be said of the action of bismuth in tertiary syphilis, for gummata and osteitis show much more rapid improvement than with mercury according to these writers, whose views can be summarised as follows: Visceral syphilis, in particular gastric syphilis and aortic aneurysm, is greatly benefited by injections of bismuth. In syphilis of the nervous system bismuth acts best on the recent manifestations of the secondary stages, especially on neurorecurrences. The best proof, however, of the activity of bismuth, according to Emery and Morin, is furnished by its effect on the Wassermann reaction. If the drug is employed early it prevents the reaction from becoming positive, while if it is delayed it renders the reaction negative, though not so rapidly as is done by arsenical compounds. Among the numerous preparations of bismuth employed in the treatment of syphilis the most popular are the tartrobismuthate of sodium and potassium, hydrated bismuth oxide, and the iodo-bismuthate of quinine. Other preparations sometimes used are colloidal bismuth, precipitated bismuth, and ditrioxybismuthobenzol. All these preparations may be and are best given intramuscularly, though colloidal bismuth and ditrioxybismuthobenzol may also be administered intravenously. The advantages of bismuth medication consist in the fact that it is well borne, that it avoids the risks of arsenical preparations, that it occasionally is successful when arsenic fails, and that it apparently has a special action on neurorecurrences. Its drawbacks, such as local pain, skin eruptions, stomatitis, constipation, or more rarely diarrhœa, depression, and headache, are comparatively trifling, and are mainly due to unsuitable preparations or excessive dosage.

The writers believe that syphilis can be treated effectually in all its stages by bismuth alone, but do not advocate an exclusive bismuth treatment, recommending that it should be combined with arsenical preparations, and to a much less extent with mercury.

[1] Conversion of Ethelbert, 597 A.D.

BARIUM SALTS IN MINERAL WATER.

BARIUM salts are rare constituents of natural waters, chiefly on account of the almost universal presence of sulphates and the exceedingly low solubility of this salt of barium. Where carefully tested for, even in the presence of sulphates, a trace may be found as in the mineral water at Buxton. In a mountain limestone water in mid-Derbyshire some milligrammes of barium were found to be present per 100 c.cm., sulphates being absent. Brandes found barium in the water of Pyrmont, and other authorities in the waters of Kreuznach and of Luhatschovitz. Barium is also known to be present in the sulphur water of Harrogate, and in the water from the mineral spring at Llangammarch (Wales). The last named is said to contain about 6 gr. of the chloride per gallon. Mr. A. Woodmansey, analyst to the Royal Baths, Harrogate, announces this week in our columns that two other springs in that locality contain appreciable quantities of barium—namely, the "Chloride of Iron" spring and the "Magnesia well." Whatever medicinal effect barium salts may produce can be obtained by the use of these waters. It is one of the few constituents of mineral waters to be credited with appreciable action upon the heart. In several foreign pharmacopœias the chloride of barium is included, but in this country barium salts have never been used to an extent to justify inclusion in the official register. Barium sulphate is employed somewhat extensively as an opaque meal prior to X ray examination, when, of course, great care must be taken that all soluble salts of barium have been washed out. These soluble salts are distinctly toxic, although they are absorbed but slowly by the lining membrane of the alimentary canal. After absorption a portion is stored in the bones but most is excreted in the urine. The chief action of barium salts is to accelerate the heart and increase the blood pressure, at least for a time, and it is quite possible, therefore, that waters containing them may be beneficial in judiciously selected cases.

WE regret to announce the death on Dec. 30th last of Dr. John Berry Haycraft, Emeritus Professor of Physiology in the University of Wales, at the age of 65.

THE Royal Society of Medicine will hold a special meeting at 8.30 P.M. on Friday, Jan. 26th, to commemorate the centenary of the death of Edward Jenner. A lecture on Jenner's life and work will be given, and several objects of historical interest will be shown. Sir William Hale-White will preside.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

I.

THE MEDICAL TREATMENT OF GALL-BLADDER DISEASE.

THE treatment of inflammation of the gall-bladder and its consequences is largely in the hands of the surgeons, for by the time that the site of the trouble can be unhesitatingly recognised the lesions are commonly so advanced that a permanent cure can only certainly be anticipated from operation. In the early stages of the milder cases the symptoms are often reflex and gastric, such as flatulent indigestion, rather than definitely localised to the gall-bladder region, but even in such instances deep pressure often brings out local tenderness. In addition to this group of cases there are others in which medical rather than surgical treatment is reasonable; there are acute cases of "catarrhal" jaundice and of jaundice with or without tenderness and resistance over the gall-bladder occurring in association with some infection, such as enteric fever or influenza.

Relation to "Bilious Attacks."

Recurrent subacute bouts of gastric indigestion without jaundice but with slight transient pain and tenderness over the gall-bladder and liver, which may be enlarged (for it has now been shown that inflammation of the gall-bladder is accompanied by hepatitis), are often regarded as much the same as "bilious" attacks or "chill on the liver." The nature of these two popular disturbances is somewhat doubtful and may vary in different instances; some are probably merely due to excess or errors in diet causing toxic functional disorder of the liver cells; indeed it may well be that both the liver itself and the gall-bladder suffer in varying degree in different cases, tenderness of the gall-bladder, of course, being a guide in forming an opinion on this point. In the absence of any definite evidence of implication of the gall-bladder treatment should consist in removal of the cause, whether infective, such as a septic focus, or toxic, from unsuitable food; rest to the liver by restriction of food verging on starvation, and by purgation by the time-honoured administration of mercury in some form or other, followed by salts. Minute doses ($\frac{1}{20}$ gr.) of calomel three times a day exert an antiseptic, though not a purgative, action on the intestine, and are often of apparent value.

More Serious Cases.

In addition to these mild cases there are not infrequently cases in which surgical treatment, though the ideal course, is either firmly declined by the patient or rendered inadvisable, at least for the time, by his or her condition. It must, however, be remembered that a frequent contraindication to operation is the condition of the heart—a toxic myocarditis—which is secondary to the gall-bladder infection and will continue, if not progress, until that is removed or improved; the risk of operation therefore is one that may have to be taken. Much may be accomplished, however, by careful medical treatment. During an attack of indigestion, pain and tenderness over the gall-bladder, with or without fever, the patient should remain in bed on a light fluid, but not too milky, diet, with hot applications to the hepatic region, and take three times a day before food a mixture containing hexamine (urotropin), which has been shown experimentally to remove infection of the gall-bladder even though the bile is alkaline; salicylate of sodium, which acts as a cholagogue, though its power in this respect has been rather variously estimated, thus helping to wash out the gall-bladder and so to remove infection; benzoate of sodium, bicarbonate of sodium, spirits of chloroform, and infusion of cloves. Hexamine should be given at first in doses of 7½ gr. and gradually increased; some patients find that it upsets their digestion, others that it irritates the urinary bladder, and in this event the last dose of the medicine should be taken before 4 P.M. so as to avoid disturbance of sleep during the night; in rather rare instances its irritating effect on the kidneys sets up hæmaturia. This mixture should be continued for six weeks after an attack so as if possible to eliminate infection; it may possibly also be of use in cases in which gall-stones are present, for there is some experimental reason to believe that gall-stones may be dissolved in the gall-bladder if a flow of healthy bile over them is restored. Single pure cholesterol calculi may form in gall-bladders which do not show any evidence of inflammation, and in such instances a normal bile may be more easily obtained than in cases of cholecystitis, and so the calculus may conceivably be dissolved. After the attack has passed off the diet should be carefully supervised so as avoid or restrict those articles of food that contain or produce cholesterol, and so would tend to favour the formation of biliary calculi; these are yolk of eggs, brains, fats, butter, stewed and fried foods, goose, duck, sweetbread, liver, kidneys, and green peas. Stagnation of bile in the gall-bladder should be counteracted by frequent small meals which lead to corresponding evacuations of the gall-bladder, and by exercise, especially those forms which entail free excursions of the diaphragm and liver. When purgation is necessary those drugs should be employed which appear to empty the gall-bladder, such as blue pill or calomel at night, followed next morning by sulphate of sodium or sulphate of magnesium in as nearly a saturated solution as possible. Lyon's method of medical drainage of the bile-ducts and gall-bladder by means of a duodenal tube, after spraying with a solution of magnesium sulphate to relax the sphincter at the lower end of the common bile-duct, may in the future become as familiar as gastric lavage, though the technique is more elaborate. It has proved useful not only in diagnosis, but in the treatment of "catarrhal" jaundice, cholecystitis in an early stage, and as a post-operative auxiliary.

Prophylactic Treatment.

An important point in the prevention of recurrent attacks of gall-bladder inflammation is the removal of any primary focus from which infection may be conveyed to the gall-bladder; it has been shown that streptococci from the tonsils are specially prone to settle down in the gall-bladder, and hence oral sepsis, which often precedes and causes tonsillitis, should be

treated; similarly suppuration in the accessory nasal sinuses should be sought for and cured. Other foci less easily dealt with are appendicitis and pelvic infections in women. Another prophylactic measure is the avoidance of the articles of diet mentioned above as prone to increase the cholesterol content of the blood, especially in the later months of pregnancy and after delivery, when there is already an increased percentage of cholesterol in the blood.

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Special Articles.

MEDICAL INSPECTION IN SECONDARY SCHOOLS.

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MEDICAL inspection in secondary schools has been carried out in a more or less complete manner voluntarily for some years by various authorities, such as Brighton, Sheffield, &c. The success of medical inspection and treatment in public elementary schools made it certain that sooner or later the benefit would be extended to secondary schools. Largely doubtless to the delaying influence of the war it was not until April 1st, 1920, that the Education Act of 1918 made inspection and treatment compulsory. An economy circular has, however, since made inspection more or less compulsory and treatment voluntary. By the end of 1921, 119 of the 145 local education authorities concerned have made arrangements for carrying out their obligations under Section 18 of the Education Act, 1918. The number of secondary schools medically inspected in 1921 was 860, the number of pupils medically inspected was 135,000.

Medical Examination before Admission.

To be logical one should commence with the need for medical examination before admission. It must be within the experience of most secondary school medical inspectors that there are a number of children filling valuable places who are quite unable to benefit by these special educational facilities. Some, for instance, are practically stone deaf, others have very marked defects of vision—a preliminary medical examination before entrance would not only eliminate these children and provide their parents with more or less sound advice as to how their education could best be carried on, but would discover at the earliest possible moment, scholastically speaking, the presence of numerous defects often readily curable which nevertheless reduce the ease with which the children assimilate the education offered.

Closely allied to this subject is the matter of the free places which must be offered to children entered from public elementary schools. As is well known, these are ordinarily 25 per cent. of the total school attendance and efforts have been made to increase this percentage to 40. The value of the scholarship provided is free tuition only; but many committees, such as, for instance, the Surrey County Council, give a number of exhibitions to free-place scholars; the value of this exhibition is such as is sufficient to meet the amount necessary for travelling expenses, together with proper school charges for books, stationery, &c. The value does not include dinner allowance, but we are told the committee will be prepared to consider applications entirely on their merits, having regard to the distance of residence from the secondary school and the position of their parents.

It is not my duty nor my function to comment on the policy or the advisability of these steps, but it is within the scope of those interested in the health of secondary school-children to suggest that if the children of poor parents are to be admitted to public secondary schools free of charge, the monetary allowance made shall be sufficiently large to cover the necessary expenditure adequately. In this way only will mental and physical suffering of the school-children be avoided. It is eminently conceivable that the parents' financial circumstances may be such that they cannot provide for the maintenance of the child at a secondary school without detriment to his health and deprivations, which must tell not only on his health but also on the health of any other children in the family. To put the matter somewhat bluntly, it really comes to this: if the parents are too poor, on health grounds the child should *not* be nominated for a free place unless the local education authority or the State are prepared to offer adequate financial help.

Results of Medical Inspection of Secondary School-children.

Doubtless many experienced school doctors could have foretold the results to be obtained from the medical inspection of secondary school-children; obviously the differences from these facts elicited by work among elementary school-children would arise from the different social status and age of the pupils. Owing to the different social status it would seem probable that the matter of vermin would be of less importance. This is borne out by facts; although verminous children are still found in the secondary school, they are very few in number. In 1919, on inspecting the girls holding scholarships at a provincial municipal secondary school, 12 out of 56 were found to have nits in their hair. Fortunately, however, at this school now that medical inspection is in full swing, and every child over 12 is examined once a year, the number of girls with nits has been very much reduced; in fact, at the last six inspections no instances have been reported. Infestation with body lice is practically never found.

In the secondary school deficiencies as regards clothing are rare. The school authorities are justified in asking for correct clothing for physical exercises. At the Municipal Secondary School for Boys, Brighton, the boys are required to change their shoes at school, and to wear "low-heeled house shoes or slippers." In the gymnasium, every boy makes a complete change into shorts and singlet; braces are not allowed. Rubber shoes only are worn—in most cases these are used in the school also. At the girls' school low-heeled house shoes must be worn during school hours. These, when not in use, must be kept in the bags provided for the purpose. Hair must be neatly tied back during school hours with navy blue or black ribbon; hat-pins and jewellery, with the exception of a brooch or watch chain, may not be worn. Every girl must have a pocket in her dress. For the drill lesson, the regulation tunic, blouse, and black gymnasium shoes and stockings must be worn, and no stays or tight clothing of any description. The hair must be neatly plaited; combs may not be worn. The tunic and blouse must be made according to the school pattern, which can be obtained from the office. The blouse must have sleeves long enough to allow the arms to be easily stretched above the head.

The parents of the secondary school child are often sufficiently foresighted as to consult the secondary school doctor if they hope to put the child into a service or branch of a service in which there is a definite statement of the requirements as to the physical condition of entrants. The parents will probably consult the secondary school medical inspector much more in this connexion than in the case of public elementary schools; in this way it should be increasingly possible, for instance, to prevent the boy or girl with high myopic astigmatism from taking up teaching as a profession.

The fundamental aim of keeping the child healthy so that he can learn in school is the same in both elementary and secondary schools. In both types of school we have to guard him against infectious diseases; to see as far as lies in our power that his

life out of school hours is hygienic; to prevent excessive indulgence in the cinema; to encourage games out of school hours.

Sleep.

We should not have the same difficulties about sleep as in the case of elementary school-children. The children we are considering very rarely, if ever, live in drunken neighbourhoods where the noise of revellers is continued far into the night, nor do they often live under the same roof with families of this kind. If it has been found necessary to issue warnings to children attending secondary schools in connexion with summer time the fact has escaped the notice of the writer. But there often is need for advice on the matter; the Jews, who are so good to their children, are perhaps especially prone to over-indulgence in this respect, and allow their children to stay up too late.

The hours of sleep for secondary schools to be recommended are:—

At the ages 8–11 years	.. .. ..	11 hours.
,, ,, 12–14	,, ...	10½–10 hours.
,, ,, 14–16	,, ...	10–9½ hours
,, ,, 16–18	,, ...	9½–9 hours.

These are minimum periods, hours actually spent in bed. Half an hour should be added for undressing; thus a child of 16 who gets up at 7.30 will start going to bed at 9.30. Although these periods are shorter than those advised by some school doctors, it should be borne in mind that if the child is allowed to stay up another half an hour this allows the game of tennis to be finished or of a cycle ride; time for culture, reading, and games generally must also be found. These periods should be increased at discretion; if a child flags, or if his or her work is deteriorating by reason of too little sleep, obviously longer hours should be recommended. The matter of hours of sleep should be made one of school discipline.

Arrangements for Midday Meals.

Suitable arrangements for midday meals are those made at the Dudley Girls' High School, a municipal secondary day school. Hot dinner is provided at a charge of 11*d*. There are about 120 children who take the school dinner. About 100 more bring their own cold lunch and have the use of a room in which tables are properly laid for them. They pay 2*d*. weekly for the use of this room and its equipment. The advantage of such provision from the health point of view is obvious.

Eyesight.

Much insistence is necessary in connexion with harmful type. One of the books most commonly at fault is the combined Common Prayer and Hymn Book, which unfortunately makes a convenient birthday present. Although the giver may hold that the child "only reads it for a quarter of an hour at a time," the book is often read in a poorly lighted place; obviously the fact that many Bibles are printed in equally harmful type is no argument in favour of the use of any book the type of which fails to come up to the required standard. A certain weekly paper brought out for school girls is printed in type which is far too small; the small dictionaries bought for a penny, and unfortunately at times recommended by head teachers, are even worse. That smallness of type is not only harmful to the eyesight is borne out by the well-known warning, "To prevent curvature of the spine give the children large print." The attention of parents and of those persons responsible for the purchase of books for secondary schools should be drawn to the British Association report on the influence of the type of text-books, &c., on eyesight. The report deals fully with all kinds of school books, maps, &c. As long ago as 1914 the B.A. Committee reported against the use of glossy paper and described a gloss-tester; hence by now any publisher should have avoided producing books which are injuriously glossy. Very satisfactory *unvarnished* wall-maps can now be obtained; all highly glazed maps should be expelled from class-rooms.

It would be advantageous if all local education authorities would undertake the testing of school books, writing papers, and maps with reference to influence upon eyesight, and refuse to purchase or allow the use in their schools of any publication found unsatisfactory in this respect.

Colour Vision.—Obviously considerable importance attaches to the testing of colour vision. Following Dr. Dunstan Brewer, of Swindon, I would suggest that the best method of examining colour vision is to employ the Edridge-Green bead test. This can be performed by the children when waiting their turn for inspection. It is unfailing for detection of any serious form of colour-blindness. If the beads are placed in the proper position it can be held that dangerous colour-blindness is absent; yet, on the other hand, no definite conclusions can be drawn from failure, so that should the child fail with the bead test another must be given before a final conclusion can be drawn. The Edridge-Green card test is probably the most trustworthy and most delicate test we possess, yet, like the Binet tests, the results require to be very carefully considered before an opinion should be expressed. Although the lantern test is very suitable for the detection of dangerous cases of colour-blindness its use is probably not practicable in schools. Wool tests are hardly worth doing.

As an example of the results from testing colour vision in 1921 in Sheffield eight boys out of 775 had deficient colour sense; not one of 763 girls presented this defect. Similarly, in Brighton, four cases of colour-blindness were discovered in 1921 among boys, 0·6 per cent., none in girls. This result is in accordance with the proportion usually found among the population generally, and with the fact that colour-blindness is very rare in girls. The deficiency found was of the green-red type. The vision of all four children was otherwise practically normal.

Homework.

In London among secondary school-children circulatory troubles and anæmia are too common; they are more frequently found than in elementary schools. Doubtless preparation for examinations and homework are harmful to many girls below tone and in a condition of nervous debility. As an example of too extended schoolwork the school medical staff elicited that in one London secondary school on Saturdays the girls attended school till 12.30, and then had three and a half to four hours' homework.

But it will be found from time to time that where the parents have complained of the length of the homework the scholar has various other interests or even duties which occupy his time, and the blame for keeping late hours is incorrectly laid on the homework. This fault occurs not only in schools of this type, but also in the day public schools; in one such school with a large Jewish element some boys attend Hebrew classes in addition to their homework for school. When we add the factor of the restricted home, a factor present in some instances, we can easily explain the seemingly less output of energy occurring during adolescence in these pupils.

In the ordinary secondary school the daily homework usually varies from 30 minutes in the lowest form to two hours in the highest. The work is not, as a rule, strenuous; it often consists of copying notes, map-making, and the like. Frequently part of the "home" work is done in school; in many schools it is reduced during the summer months. An excellent arrangement is for the amount of homework to be posted in each class-room, and for each child to have a diary in which is entered the time allotted to each homework lesson. The boys or girls should enter the time actually taken each night, and this diary should be initialled weekly by the parent and by the form teacher, and the diaries personally supervised by the head of the school.

Travelling to School.

Evidence as to the influence on health of children travelling long distances to school is very scanty. In Cumberland, however, a number of parents in one

area having complained that the travelling was prejudicially affecting their children's health, Dr. Kenneth Fraser made careful comparison, at the request of the headmaster, between the children living locally and those travelling from a distance. The numbers examined were very considerable, and the comparison was made without the school doctor knowing which belonged to the group. He found that there were *fewer* defects—such as anæmia, debility, lung affections, &c.—which might be attributed in whole or part to overstrain among those who travelled from a distance of seven or eight miles daily than among the local children.

Mental Condition.

The problem of backward boys in public and municipal day-schools is dismissed rather than solved by the superannuation of those who cannot advance with the average boy. A boy in the lower school of a public school after the age of 16 "leaves" sooner. Presumably much the same occurs in the case of girls. Backward school children of a higher social standing than public elementary school children are at present presumably provided for in private schools or handed over to rural clergymen for education. Whether a larger measure of public control over the education of such children is desirable or not is a question which will ultimately require answering by lay and medical educationists.

Moral imbeciles are merely dismissed from public schools, and in consequence from the point of view of the prevention of crime it is doubtful whether such persons are dealt with at a sufficiently early period of their career.

Puberty.

Passing now to the subject of puberty, I would suggest that many of the views of educationists on puberty up to the present have been derived from the ancient Greek philosophers. Perhaps the opportunity now afforded to the medical profession of routine observation of a large number of children in this connexion will do much to promote a more exact knowledge of this period of life. Puberty may be considered to commence about the time the elementary school child is leaving school. In girls in the Temperate Zone puberty does not usually set in before the fourteenth or fifteenth year. The age of puberty in a healthy male in this country varies from 14 to 17 years, the date of its appearance being affected by the boy's constitution and moral circumstances under which he is placed.

In the immediate past we have been told, largely by non-medical writers, that the systems of circulation and digestion, in their endeavour to meet the variety of strains caused by the development, are particularly liable to disorder; also that this is the period when habits of alcoholism are initiated and established, and when the craving for the similitude of manliness requires the assistance of tobacco. But one feels that the need for alteration of the habits of children of this age will probably be very slight. Again, we are told the central fact of adolescence is emotional change. Observations by medical men of members of their own family, however, tend to bear out this statement. While awaiting research of this psychological subject, in the meantime it would seem advisable that all school doctors dealing with secondary school children should use their influence to prevent any excessive punishment for breaches of discipline which clearly have their origin in the altered emotional state due to the certain physical change.

Masturbation is a matter which merits attention; every school doctor should have formed his own opinion on the subject. I do not know if the new work will enable us to get to the truth of the extent of masturbation. This trouble has been variously held to commence at the age of 8, 10, or 11 years; in a large proportion of the cases we are told that it has been learned and practised before a boy has got into his teens. "Adequate and timely instruction of all" might be held to be unnecessary; possibly a general remark or so by one of the boy's parents is better than anything else. Just as a girl should be told that the loss of blood from the genital organs is natural at a certain time, so should boys be told that seminal emissions are matters of very little import. When the practice is suspected, the school doctor might have a talk with the boy after having seen the parents, and the evil effects of the practice pointed out without any unfortunate exaggeration. At the same time an investigation should be made into the child's mental life and any desirable physical examination made to discover an obstacle to the sublimation of the sexual impulse.

Games.

Whether we agree that games play too great a part in the post-war curriculum of the secondary school child or not, we have to acknowledge the fact that games loom very largely in his school life. The extent to which games can be indulged varies considerably in the type of school: the town municipal secondary school, the public day-school, and the public boarding school; but in any event, owing to the raised age of most of the children, official games play a larger part in their curriculum than in the case of the public elementary school child. The playing fields of urban secondary schools especially are conspicuous by their absence, and the possibilities generally for games are more limited or less utilised. In practice at present heart lesions appear to be of more interest to the municipal secondary school doctor than other conditions. In girls' schools it would seem that strenuous games like hockey are played by pupils affected with heart lesions. At Brighton, for instance, in 1921 four girls were advised to discontinue the game and their practice of physical exercises moderated to prevent fatigue or strain. Similar advice was required in the boys' school. Probably, however, at present it is only in the boarding schools that we find adequate opportunities for applying the criteria of fitness for games. These are:—

1. General physique.
2. *Heart.*—Normal area of cardiac dullness—normal sounds—normal reaction on examination after exercise. Any increase of cardiac dullness or alteration of sounds demands inquiry; test urine and arteries for cardiac vascular and renal diseases, e.g., post-nephritic trouble.
3. *Lungs.*—The points of interest are: Absence of disease on examination; effect of old pleurisy with adhesions limiting expansion. Expansion should be satisfactory—e.g., 2 inches—otherwise exercise is likely to be fatiguing.
4. *Hæmic Diseases*—e.g., anæmia. Moderate exercise only is advisable.
5. *General routine medical inspection* should be utilised to eliminate the unfit from games, and also to enable grading of exercise—e.g., fives, squash, tennis, cricket, football, cross-country running, &c.—to be advised in appropriate instances.

It is interesting to note that examinations of the urine of children at a London public elementary school revealed the presence of much albuminuria. In December, 1920, of 397 children examined, 91 showed the presence of albuminuria—i.e., not less than 20 per cent. This albuminuria must be considered as physiological in character. From the investigation made it would appear that the more boys are trained for sports the more likely are they to have albuminuria.

In most municipal secondary schools there is a fully trained teacher of physical education, fortunately of the same standing as teachers of other subjects. Usually the gymnastic master or mistress is present at the medical inspection. As a matter of fact they should always be present at medical inspections and any defects of the children, especially those of growth, pointed out to them. At the swimming baths these teachers have excellent opportunities of observing the children's physique, and are thus in a position to inform the school doctor as to each child's muscular capacity.

The condition of the water of swimming baths is not without interest. Although the exact amount of disease caused by dirty water in swimming baths cannot at present be stated, it is difficult to

avoid a prejudice in favour of clean water. The advisability of disinfection of swimming-bath water should be borne in mind if circumstances make this precaution desirable.

Games for Girls.

A committee was formed in October, 1921, at the instance of the College of Preceptors, to consider physical education for girls and its possible harmful effects. The report of the medical members of the committee might be considered by some to be too cautious. Very few can disagree with the view that any game might become unsuitable if practised in such a degree as to cause undue strain or fatigue; also that the balance between the amount of exertion and the amount of fatigue may, on examination, result in the girl having to play games less strenuously. But although the committee considered that the use of gymnastic apparatus needs special care as injurious effects might come from exertion of this sort it might be maintained that very little evidence is forthcoming on this point. With regard to restriction of physical exertion during menstrual periods the medical members of the joint committee are not prepared at the present to state any opinion on the question. I would suggest that the position can be taken up that there is no clear proof that the physical education of girls produces any undue strain and that for girls is a distinct advantage.

The only form of sport condemned by the committee was football, but it is difficult to see in what respects this game is much "harder" than hockey. Very few will quarrel with the view that no one game need be exclusively played, and that the main aim is that the girls should leave school with well-set bodies as well as well-set minds, having already formed habits of love of open air, walking, games, and other pursuits to bring them into the open air as much as possible in after-life.

It is a matter for regret that under present conditions those children who most require the benefit of physical exercise through their lack of skill find difficulty in playing games for the reason that these are run too much for the benefit of the better players. In a school which is thoroughly well organised with regard to physical education the responsible persons would insist on making this type of child play the games. As it is, the most we can expect at present is for the child to perform the "physical exercises," which must be put into the curriculum unfortunately.

If the proverbial man from Mars were to visit the earth one of the most extraordinary of spectacles provided for his delectation would be numbers of boys and girls arranged in rows making absurd movements at the command of the teacher. It is difficult to hold that these physical exercises are nothing but an unfortunate necessity, they are merely "corrective," using the word in its widest sense—that is to say, they have to make up for deficiencies in the provision and equipment, and especially in the organisation of a school for physical education. An interesting suggestion, which owes its origin to Dr. R. H. Crowley, is that an experiment should be made to see how far the exercise obtained in the carpentry shop, the blacksmith's shop, &c., attached to schools (Oundle being especially well equipped in this direction) can take the place of these physical exercises. Obviously, however, at present these physical exercises are very useful in connexion with minor deformities due to growth, such as flat chest, also for poor physique and postural spinal curvature. For the sake of clarity it is perhaps advisable to hold that for spinal curvature of a marked degree special remedial gymnastics should be given by the physical instructor under the supervision of the school medical officer, while for deformities of a greater degree the orthopædic clinic is, of course, necessary.

At a Medical Congress on Physical Education recently held in France, the general consensus of opinion was that systematic teaching in connexion with this subject should be given to students at the large hospitals; in this country the already overloaded medical curriculum would appear to make us face the fact that any such teaching must be provided in post-graduate classes for those medical practitioners who are especially concerned in this branch of medical work. A body such as the Central Committee for the Care of Cripples, or a committee with similar functions, is apparently the one most appropriate to organise the much overdue course on the medical aspects of physical education.

TREATMENT OF THE BLINDED SOLDIER:

A COMPARISON OF GERMAN AND BRITISH METHODS.

Captain Ian Fraser, chairman of the Blinded Soldiers' and Sailors' Hostel, commonly known as St. Dunstan's, has recently returned from a short stay in Berlin, whither he went at the request of the committee of St. Dunstan's to investigate the re-education, training, and after-care provided by the German people for their blinded soldiers. What follows is an abridged account of his visit in his own words.

The Numbers of the War-Blinded.

Properly to appreciate the conditions under which these men are living it is necessary to have some idea of the general economic and social life in Germany, so that I shall deal in this article not solely with my mission, but with inquiries of a general character which I was obliged to make. There are, it appears, between 3500 and 4200 Germans blinded in the war. The British Empire suffered about 2000 similar casualties; the French Republic, as far as we know, between 3000 and 3500, and the Belgians and Americans perhaps 100 or 125 together. When the number of Russian soldiers blinded before the Revolution is added, the number of Germans blinded is evidently very much less than the total number amongst the Allies engaged upon the German fronts. This is not, of course, strange, for the German casualties were less than ours throughout the war, mainly because the German armies were fighting upon interior lines. Thinking that I might find an additional reason for their relatively small number of blind casualties, and remembering how ingenious were the Germans in the construction of protective devices in their trenches, I inquired if they had developed some form of face protection against high-explosive shell splinters, but could hear of no such thing. It will be remembered that one or two unsuccessful efforts were made in England to devise some form of screen or visor for this purpose. As amongst British soldiers, only a few had suffered eye wounds from bullets, grenades, &c. Some of the men we saw were abnormally mutilated, but whether this was due to the greater destructive power of our weapons, or to the possibility that the most severely wounded men would naturally preponderate amongst those still being re-educated at a date so distant from the cessation of hostilities, I do not know.

Nature of Injuries.

As far as I could gather, there is no soldier who has been both totally deafened and blinded in Germany, though, as in this country, there are a good many whose hearing has been affected in a more or less serious degree. Also, apart from temporary blindness, there is not a case on record of a man having lost his sight from gas. Contrary to the general belief on this subject, this is also the case in England. Inflammation of the frontal sinus and similar head troubles were fairly numerous, I was informed by an eminent ophthalmic surgeon in Berlin, and they have been treated in much the same way as our surgeons have dealt with similar cases here. This same professor told me that there have been one or two isolated instances in which men who had detached retina had been given back a certain amount of sight by opera-

tions, but that these were extremely rare. This again is similar to English experience.

International Resemblances.

The same informant happened to be adviser to the German Ministry of Pensions upon the very difficult subject of the attributability to or aggravation by war service of a man's condition, and I gathered from him that in this matter, as indeed in almost all questions of principle affecting the award of pensions, the German system was almost exactly like ours. I was very struck by the similarity between German laws and our laws on this subject, and was inclined to form the opinion, which at first I hesitated to hold, that the German mentality, the German idea of justice, and the degree to which they are possessed of the quality of sympathy were extremely like our own. I discussed this matter with one or two intelligent observers of German psychology who had been in the country both before and since the war, and also with many British officers on the Commission of Control, and found that they held exactly the same view. Now that the Germans have scourged themselves of Prussianism, which was a blight upon a peace-loving people, I am convinced that they are a race who are entitled to more respect and consideration than many Englishmen are prepared openly to give them.

Conditions in Germany.

The German people are extremely poor. This fact, and not, I think, any lack of sympathy on their part, is the cause of the miserably insufficient pensions which their disabled men receive. I made a number of inquiries among working men and employers in regard to wages, and though I would hesitate to put forward these figures with absolute certainty I think it is fairly safe to say that 5000 marks in Germany were worth last month to a working man about 19*s.* or £1. Now the Berlin tram-driver, or a taxi-driver, or any ordinary working man, engaged in an occupation of this standing, gets 5000 or 6000 marks a week. This enables him to purchase for himself and his family about the same value in housing, food, clothes, &c., as an Englishman could obtain for £1 or 21*s.* There is not so much unemployment in Germany as in England, but there is infinitely more poverty, infinitely more suffering, and very much less food. I believe that Germany is enjoying a period of good trade similar to that which we enjoyed for a year or 18 months after the war, and that immediately the printing of paper money is curtailed, as it must be curtailed, acute depression and unemployment will be experienced. I cannot speak of conditions in the country districts, for I was too busily engaged to be able to leave Berlin; but in that city German working men and women, on full work, are existing upon weekly incomes which leave them considerably worse off than those who are unfortunately unemployed in this country. The idea many Englishmen have that the Germans are doing well, and that the war has left them better off than ourselves, is clearly wrong.

The Individual German Blinded Pensioner.

The pension received by a German blinded soldier is about 7000 marks a month, with an allowance of 1400 marks a month for each child. This means that a married man with two children has about 10,000, or approximately £2 a month, if my estimate of the purchasing power of German money in Germany be correct. No attendant allowance is made, but to the above amount must be added about 400 marks per month, allowed for the upkeep of the dog-guide provided instead by the State for each blinded soldier. This, or any other guide, is allowed to travel on railways free, and in addition veterinary attention for the dog is provided, at State expense, if required. Judging from remarks made to me by individual blinded soldiers the dogs are a great asset, and probably 3000 men use them. They are the same type of dog as the police-dog which was used by the Germans, and I think by some of the Allied Armies, for the carrying of messages, and in connexion with medical services in the field, during the war. Trained at a special State-owned farm, these dogs are remarkably efficient as guides. They wear a sort of harness round their shoulders, with a stiff leather handle about a foot long coming up almost in a vertical position from the middle of the animal's shoulders. The blinded soldier holds on to this handle, and is thus able to feel any forward, backward, or sideways movement of his guide. When the dog's blind owner desires to cross a road, the dog sits down, and no amount of impatience on his owner's part will make him move forward until the way is clear. The dogs are most unnatural as far as their relations with their own kind are concerned, for they pass them by with complete indifference. Whether or not the dogs are trained by harsh treatment I cannot say, but they are certainly affectionately regarded by their owners, and are well looked after. Nevertheless, I should not like, and I do not believe British blinded soldiers would like, to be accompanied in both town and country by an animal with an elaborate harness and a red cross on each shoulder.

Training for the Blinded.

There are only two services rendered to blinded soldiers in Germany which resemble in the least the activities of St. Dunstan's. One is a school in Berlin, in which about 500 of their men have had the opportunity of learning Braille and typewriting, massage, shorthand-writing, telephone-operating, &c., and of adapting themselves as did a few of the St. Dunstan's men, for a return to their pre-war occupations. But though the same subjects were taught in this school as at St. Dunstan's a much smaller degree of success has apparently been attained. For example, only ten masseurs were trained, and then the idea was given up because the men were unable to do well. Whether this is due to the training, or to other conditions over which the school had no control, I was unable to find out. But there must have been an enormous demand for masseurs in connexion with war injuries, and had the training been good there would at least have been a temporary boom in this work for blinded men. Telephone-operating, again, has only been a partial success, for the only men at present employed are those who were previously working in the German Post Office. With steno-graphy and typewriting they appear to have had better results, for 80 or 90 men, employed all over Germany, are said to be doing relatively well. An exact copy of the shorthand machine supplied to English blinded soldiers is being used by the Germans.

The second direction in which German blinded soldiers are able to obtain assistance similar to that available for Englishmen is in connexion with pension inquiries, for there is an organisation, very meagrely supported by voluntary subscription, which does for them what the St. Dunstan's pensions department does for our men. Apart from the 500 men I have mentioned, who went through the Berlin school, and prepared themselves for professional life, there have been practically no special arrangements made for German blinded soldiers by the State or by voluntary enterprise, and the remaining 3500 or more of their men were left uncared for with the exception of a few who found their way into civilian blind institutions, until the employment of disabled men in factories was made obligatory upon employers by the State. It appears that some of those who went into civilian blind institutions stayed there, doing brush-making and basket-making, and if the conditions in the largest civilian blind workshops in Berlin, which I visited, are at all similar to those in the provincial institutions, I do not envy the men their lot. Others, however, merely passed through a period of training and then returned to their homes. In some cases they were given tools and equipment, but in no case did they receive any form of after-care, and thus only a small number have been able to make a success of their work. When the Act for compulsory employment of disabled men in factories was passed, local committees, rather similar to our employment exchanges, or war pensions committees, were set up all over the country, and a register of all employers in their districts was kept.

The employer was obliged to take into his works or factory a number of men, having a disablement greater than 50 per cent., amounting to not less than 2 per cent. of the total number of his workmen.

A blinded soldier would apply to a committee for employment. Through their register they would see where there was a vacancy, and would send him along. From this point the State ceased to have any interest in the man, and it was up to the employer to do what he could to fit him into his business. I fear that the majority of employers have put their blinded men on to dull, unskilled, monotonous work. There are amongst employers, however, one or two notable exceptions, who seem honestly to have considered the welfare of their men. Foremost amongst these is Siemens' Electrical Works at Siemenstatt, a few miles outside Berlin. Here, in one workshop where small metal parts are manufactured, there are 80 blinded soldiers amongst two or three hundred sighted employees. They fit into the routine of this factory, each doing an automatic job with an electrically driven machine specially adapted for his use. This is the only example of really good factory employment for the German blind on a large scale. The men earn piece-work wages about equal to women employed upon similar machines, or about 80 per cent. of the wages of sighted unskilled workmen. The striking thing here is not the skill of the blind men, which though good is not surprising, not the cleverness of the machines, but the goodwill of the firm. Even this work I should consider to be dreadfully monotonous, but practically the only alternative is idleness, and financial conditions, low pensions, &c., force the men to carry on. I feel there are few British blinded soldiers who would undertake this work, but it might meet a long-felt want for the civilian community, the majority of whom have no better alternative. I do not think I can honestly say that we have much to learn from Germany, but in view of the exaggerated reports we have had from time to time as to this work at Siemens I think it is a good thing that the matter should have been examined.

Briefly, then, I have come back from Germany with an increased regard—if that was possible—for my own country, and a greater pride in St. Dunstan's; and I am extremely thankful I am not a German blinded soldier.

ROUMANIA.

(FROM OUR OWN CORRESPONDENT.)

Precautions Against Cholera.

ON account of the prevalence of cholera in Russia and in some parts of Ukraine the President of the Roumanian Medical Council has laid down regulations with a view to preventing the importation of the disease into Roumania. Every person arriving at the frontier from a place infected with cholera, and presenting possible symptoms of the disease, will be detained at the railway station by an officer appointed for the purpose, and isolated until seen by a medical man. If the case is one of cholera, the commissary, acting in concert with the municipal authority, will convey the patient to some suitable place for isolation. Carriages which have been occupied by persons suffering from cholera must be emptied and disinfected. The bringing into Roumania, except as personal luggage, of dirty linen and soiled clothing or bedding from infected districts is forbidden by law. When lodgings are taken by persons who either come direct from infected places or have left such places within the preceding eight days, the householder must, within 24 hours of their arrival, report the fact to the nearest police medical station. Every suspected case of illness must also be reported immediately and all such cases isolated; preventive measures must be undertaken with respect both to the patient and to his contacts.

Infectivity of Tuberculosis.

The Bucharest Commission on Tuberculosis issued its report in November, giving definite answers to certain questions submitted for its consideration. These answers are derived from a number of experiments carried out on behalf of the Commission on a large Government farm, and may be thus summarised: (1) In many cases human tuberculosis is identical with the bovine disease; (2) mammals and man can be reciprocally infected with the disease; (3) tuberculosis can be communicated to man from infected cow's milk or tuberculous meat (pork or beef), but the danger from fowls, geese, and turkeys is negligible; (4) there are three distinct types of tubercle bacilli—avian, bovine, and human; (5) the bacillus of lupus is of the bovine order, but is of a modified type and differs in certain respects from the usual bovine bacillus found in cattle.

Antivivisection Movement in Roumania.

In Bucharest, the opponents of physiological research are endeavouring to revive the old argument that vivisection is useless for the advancement of medical science, and may even be the cause of disastrous errors. Forty or 50 persons, some of them well known, have formed a little society for the propagation of these views, but at their first meeting held recently in the city the attendance was small.

DEC. 26th, 1922.

MEDICINE IN U.S.A.

(FROM AN OCCASIONAL CORRESPONDENT.)

American Relief Work in the Near East.

WHATEVER may be her attitude in political matters America is still compromising her isolation in order to relieve sickness and suffering in the Old World. No sooner had the American Red Cross finally withdrawn from Europe than destitution and disease in the Near East summoned that generous organisation back with its irresistible appeal. The sums set aside for this new work already total close on a million and a half dollars. In order to help in the raising of funds, the President issued from the White House to the governors of all States an appeal in which he designated Sunday, Dec. 3rd, as "Near East emergency day."

Other Forms of Coöperation.

It will be remembered that the United States was represented at the second conference on the standardisation of antitoxins held under the auspices of the health section of the League of Nations at the end of November. It is now announced that Miss Grace Abbott, of the U.S. Children's Bureau, has been appointed to coöperate with the advisory committee of the League of Nations on traffic in women and children. The appointment is "unofficial" and Miss Abbott will serve in a "consultative capacity." These marks of a formal policy do not, however, disguise the real interest of the United States in all international work for health.

Street Accidents.

Evidence of the appalling risks which children run in our larger cities from automobile accidents continues to accumulate. The 1922 report of the Committee on Public Accident Statistics of Chicago, just issued, analyses the accidents reported in 1920: 13 per cent. of all accidental deaths were of children under five years of age. One-third of all people killed in automobile accidents were children under 15. Various attempts have been made to counteract this evil, which seems to be the necessary consequence of the widespread ownership of motor cars. "Safety-first" campaigns reduce the accidents only while the campaign is in progress, and automobile tragedies retain their place amongst the more important causes of death. A mayor of one large town has recently decreed that those convicted of dangerous driving shall be taken to the mortuary and the hospital to see the common consequences of their carelessness. Even this cannot be totally effective if a recent report from Detroit is typical of the country at large. Here the men convicted of "speeding" were subjected to an examination by Dr. A. L. Jacoby, the city psychiatrist, before sentences were promulgated. Dr. Jacoby found

that out of 17 persons convicted (all on one day!) 3 were mentally deficient. One of these, who was charged with driving at 32 miles per hour, was also deficient in hearing and sight, and could not differentiate between the "go" and "stop" signals used by the traffic controller. It is clear that only a stringent examination for the driving licence will protect the public from such dangers as this.

A Psychiatric Clinic.

A mental hygiene survey in the town of Cincinnati (Ohio) this year resulted in recommendations for a coördinated municipal effort centring in a psychiatric clinic and including the public school system, the social welfare agencies, the police courts, and the faculties of the local universities. The scheme was well supported by prominent representatives of medicine, law, and education, and as a result $30,000 a year of public money has been voted to carry it into effect. Cincinnati is the first town in this country to adopt so comprehensive a scheme.

A Health Journal for the General Public.

An important new venture is being undertaken by the American Medical Association, which is to publish a new journal of "individual and community health." *Hygeia*, as it is to be called, will be written in non-technical language, so that all may benefit from its teaching. It is understood that many prominent medical men have undertaken to contribute. The first number is promised for April, 1923.

Cancer Publicity.

As a result of the publicity organised by the American Society for the Control of Cancer during the recent "Cancer Week" no less than 2864 personal requests for information have been received by the society. Your readers are, no doubt, aware that this society seeks to combat cancer by spreading a knowledge of the predisposing causes and early symptoms of cancer, and of the importance of early diagnosis and treatment.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH: SUGGESTIONS BY THE SCOTTISH BOARD.

THE Scottish Board of Health has issued a circular, under date Dec. 28th, 1922, to medical officers of health for Scottish burghs containing hints for increasing the usefulness of their annual reports. In cases where these reports are printed, the Board suggests that arrangements should be made for a judicious local distribution of the reports as soon as they are available, and that steps should be taken through the local press, and otherwise, to bring their contents effectively to the knowledge of the people. One of the main purposes of the compilation of the reports is recognised to be that, by giving them the widest possible publicity, they may engender a popular interest in the subject, and an enlightened public opinion to support the local authority in realising its high responsibilities for the health of its area, and in remedying, at the earliest opportunity, the various defects which the survey may bring to light. Such an increase of public knowledge and interest in these matters may also, it is suggested, become an effective means of educating the citizens in the more important conditions of public health, of warning them against particular dangers, and of securing that important coöperation and confidence between them and the health authority and its staff which is essential to successful health administration.

The annual report, it is recommended, should be concerned chiefly with the conditions affecting health in the burgh and with the means for improving those conditions. It should contain an account, brought up to the end of the year under review, of the sanitary circumstances of the burgh and of any improvement or deterioration that may have occurred during the year. Care should be taken to report fully and explicitly on injurious influences in any degree affecting or threatening to affect the public health in the burgh, and on the action that has been taken or that may still be required to combat these influences. It is of special importance that medical officers should record what action has been taken to remedy unhealthy conditions that have been referred to by them in previous reports, and that attention should be called afresh year after year to such as remain unremedied.

Report is specifically asked for from the medical officer of health on the following points:—

1. A general account of influences and conditions injurious or dangerous to the health of the burgh, and of the measures that in his opinion should be adopted for its improvement.

2. A statement of the general inquiries he has made during the year, and of any special inquiries as to sanitary matters.

3. A general statement of any matters as to which he has given advice or granted certificates, including any action as to offensive trades.

4. A specific account of the administration of the Factory and Workshop Act, 1901, in workshops and workplaces.

5. An account of any proceedings under the Housing (Scotland) Acts, 1890–1920, dealing specifically with (1) the sufficiency and habitability of working-class dwellings; (2) any schemes under consideration or contemplated for the improvement of insanitary areas under Parts I. and II. of the Housing of the Working Classes Act, 1890; and (3) the action taken where instances of overcrowding have been ascertained or suspected.

6. A statement showing whether any conditions have arisen, or are expected to arise, pointing to the expediency of a town-planning scheme for the proper control of further development.

7. An account of the presence or absence of pollution of rivers or streams in the district, the sources and nature of any such pollution, and any action taken to check it.

8. An account of any proceedings under the Burgh Police Act.

9. An account of the hospital accommodation available for persons suffering from infectious disease in general, and from small-pox in particular (including the means provided for the conveyance of such persons), and of the houses of reception, with observations on the furnishing, maintenance, administration, and adequacy of such accommodation, &c.

10. An account of the premises with necessary apparatus and attendance available for the destruction or disinfection of infected articles (including the means for the conveyance and return of such articles), also of other processes of disinfection in use, with observations on the adequacy of such arrangements and processes.

11. An account of the action taken to prevent the outbreak and spread of infectious disease.

12. A statement of any action taken (*a*) for the control of acute primary pneumonia, acute influenzal pneumonia, malaria, dysentery and trench fever, under the Public Health (Pneumonia, Malaria, Dysentery, &c.) Regulations (Scotland), 1919; and (*b*) with regard to "carriers" under the Public Health (Infectious Disease Carriers) Regulations (Scotland), 1921.

13. A statement of the facilities available for the treatment of persons suffering from venereal diseases, with recommendations as to any further measures that might usefully be taken for dealing with these diseases.

14. A statement as to the causes, origin, and distribution of diseases within the burgh, and the extent to which the same have depended on or have been influenced by conditions capable of removal or mitigation.

15. A statement of the measures adopted for the administrative control of tuberculosis, with recommendations as to any further measures that might usefully be put in force.

16. A statement of the arrangements made under the scheme of maternity service and child welfare.

17. A report on the working of the Notification of Births Act, 1907.

18. Observations on the wholesomeness of the milk produced within or imported into the district and on the general adequacy of the arrangements for the supply and distribution of milk of pure and wholesome character; also on the administration of the Dairies, Cowsheds, and Milkshops Orders and the Milk (Scotland) Order, 1921; and any action taken as to tuberculous milk, whether under local Acts or under the Dairies, Cowsheds, and Milkshops Orders.

19. An account of the work done under the existing arrangements for the inspection of meat at slaughter-houses, shops, and elsewhere; observations on unsound food, food inspection, and the sanitary condition of premises where foods are manufactured, prepared, stored, or exposed for sale, indicating any important respects in which existing

powers have been found inadequate for dealing with insanitary conditions in such places.

20. A report on the work done by the local authority under the Sale of Food and Drugs Acts, and under the Sale of Food Order, 1921, with observations on any special questions which have received or require attention.

21. A tabular statement, in such form as the Board may direct, (1) of the cases of infectious disease notified in the burgh, and (2) of the infantile mortality in the burgh.

The medical officer of health is asked to transmit a copy of his report to the Board and to the local authority not later than April 30th, and he is reminded that report must be made to the Board, with the least possible delay, of every case of ophthalmia neonatorum in which, in his opinion, there occurs appreciable loss of vision.

A SURVEY OF PUBLIC HEALTH IN SOUTH AFRICA.

UNDER the title of the Public Ill-Health, Dr. J. A. Mitchell, secretary for public health and chief health officer to the Union of South Africa, delivered a stimulating address to the recent South African Medical Congress at Johannesburg. His frank review of failures is not merely of local interest and we summarise, as closely as possible in Dr. Mitchell's own words, some of the features which he finds disquieting in the public health of the Union.

First, he mentions the overcrowding and insanitary housing of a considerable section of the population, both European and native. Many of the smaller towns and villages have polluted water-supplies, leading to a prevalence of worms and intestinal diseases. In many centres tuberculosis is a serious scourge. Malaria is prevalent and is retarding the development of a large part of the Transvaal, Zululand, and the northern coastal belt of Natal, comprising the most fertile districts. The death-rate of the Union is descreditable. The infantile mortality among Europeans in the Union is twice as high as it should be; in some places it could be halved, in others it could be reduced to a third of the present rate. There is widespread ignorance and carelessness as regards health matters, including the care of infants and children and the feeding both of children and adults, while little is being done to enlighten the rising generation in these matters. Very few are short of food, but a considerable proportion eat too much for the work they do, and still more eat the wrong kind of food or do not cook it in the right way. School medical inspectors report that malnutrition is common, even in the children of the well-to-do. Children are fed on sloppy food, requiring no mastication, resulting in decayed teeth and ill-developed jaws. Attending football matches, &c., is more popular than participation in games. There is much use of patent nostrums and "Dutch" medicines. There is a great dearth of competent maternity nurses, and an enormous consequent loss of infant and maternal life. The people as a whole are too extravagant and pleasure loving. The Union, with a white population of 1,500,000 and an annual government expenditure of £29,000,000, spent in 1920 £900,000 on bioscopes and entertainments, and £11,000,000 on liquor. There is a growing disinclination in both sexes for the ties and responsibilities of marriage. The average age at marriage is increasing and so is the divorce rate. In Johannesburg the annual number of divorces is more than one-third of the marriages. Large families are out of fashion and birth control is on the increase. A type of female—more or less of the neuter gender—is increasingly common; she does not marry, or if she does, she proves sterile or takes care to have no children, or at most one or two, and these she brings up on the bottle. Were this state of things to continue and increase, says Dr. Mitchell, the prospect of building up a strong white nation in South Africa would be gloomy indeed.

Fortunately, however, there is another side to the picture. In recent years, and especially since the influenza epidemic, all responsible authorities have been devoting more attention to health matters. The public press is lending a hand. Religious organisations are realising that they cannot hope to survive on dogma, ritual, and abstractions, and that mankind to-day requires a practical religion applied to the current problems of life. The boy-scout and girl-guide movements have beneficial and far-reaching effects. The Red Cross is doing good peace work. The thinking and intelligent section of the public is waking up. The crying need of to-day is for more knowledge, for a return to simpler habits of life, for a truer appreciation of the things that really matter, and for better organisation.

Dr. Mitchell passes on to ask what the medical profession is doing in connexion with these matters. In civilised countries to a large extent advancement in the public health depends upon the knowledge and effort of the individual. "Is the medical profession in South Africa playing the part it could and should play in diffusing that knowledge and awakening that sense of responsibility?" asks Dr. Mitchell, and he goes on to say "that some means should be devised of giving the private practitioner a live, real, and financial interest in prevention." He is not in favour of a State medical service free to all. He realises that specialist assistance must be brought within reach of all and regards the Dawson report as an excellent basis for discussion. He concludes by a reference to the profit made by the Metropolitan Life Assurance Company of New York by the system, instituted in 1914, of free periodical medical examination and advice for their policy-holders.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdrs. to be Surg. Capts: R. J. MacKeown (*Vernon*), F. H. Nimmo (*Victory*), R. F. Clark (*Vivid*), and R. St. G. S. Bond (R.N. College, Greenwich).

Surg. Lt. K. A. I. Mackenzie to be Surg. Lt.-Comdr.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt.-Comdr. R. Wilbond to be Surg. Comdr.

Hon. Surg. Lt.-Comdr. F. J. Hannan to be Hon. Surg. Comdr.

ROYAL ARMY MEDICAL CORPS.

Col. R. J. Blackham, late R.A.M.C., is placed on half pay.

The undermentioned Lt.-Cols., from R.A.M.C., to be Cols.: Bt. Col. R. S. Hannay, vice Col. A. H. Morris (ret. pay); (Temp. Col.) H. P. W. Barrow, vice Col. R. J. Blackham.

Lt.-Col. G. B. Riddick retires on ret. pay.

Lt.-Col. G. M. Goldsmith relinquishes the temp. rank of Col.

Capt. and Bt. Maj. L. G. Bourdillon retires, receiving a gratuity, and is granted the rank of Maj.

Capt. A. E. Drynan resigns his commn.

ARMY RESERVE OF OFFICERS.

The undermentioned cease to belong to the Res. of Off. on account of physical unfitness: Lt.-Cols. J. P. Silver, C. S. Smith, W. F. H. Vaughan, F. S. Walker, M. C. Wetherell, and A. H. O. Young; Majs. W. M. Power, (Bt. Lt.-Col.) G. F. Sheehan, and F. T. Turner.

Lt.-Col. W. Owen-Prichard, late E. Afr. Med. Serv., to be Lt.-Col.

ARMY DENTAL CORPS.

Capt. U. J. G. Dancer, late Spec. List, to be Capt.

TERRITORIAL ARMY.

Maj. L. D. Bailey to be Lt.-Col., and to commd. the Co. of Lond. Fd. Amb.

Capt. R. S. Taylor resigns his commn. and retains the rank of Capt.

General Hospitals: The undermentioned, having attained the age limit, are retired and retain their rank except where otherwise stated: Lt.-Cols. G. E. Wherry, F. Deighton, E. Hobhouse, R. F. Jowers, E. F. Maynard, and F. J. Paley; Majs. A. Cooke (granted the rank of Lt.-Col.), E. L. Jones, J. A. Wright, W. Broadbent, C. F. Bailey, T. H. Ionides, F. G. Bushnell, and W. A. Bowring; Capts. (Bt. Maj.) J. F. Fawcett and (Bt. Maj.) A W. Ormond; Capts. J. Gutch, G. S. Haynes (granted the rank of Maj.), P. N. B Odgers, H. W. G. Mackenzie, H. G. Turney, W. S. Colman, R. P. Rowlands, R. J. Probyn-Williams, M. Horne, H. F. ancaster, and F. D. S. Jackson (granted the rank of Maj.).

The undermentioned relinquish their commns. and retain their rank, except where otherwise stated: Maj. R. A. Milligan; Capts. J. Young (granted the rank of Lt.-Col.), J. G. Morgan (granted the rank of Maj.), H. B. Pope (granted the rank of Maj.), A. G. Banks, H. M. McC. Coombs, H. E. Roaf, J. B. Kelly, J. P. Mathews, W. Sharrard, J. E. Dunbar, A. C. McMaster, J. Lloyd, and G. I. Strachan.

Sanitary Companies: Capts. (Bt. Maj.) C. C. Frye, (Bt. Maj.) G. W. Ellis, E. C. Sprawson, E. A. Cooper, C. J. D. Gair, R. Robison, J. E. Wilson, C. E. C. Ferry, N. A. Dore, M. Greenwood, P. Hartley, G. L. Matthews, E. R. Matthews, W. Buddin, S. A. Mann, J. Davidson, J. Tate, F. E. W. Rogers (granted the rank of Maj.), A. F. Girvan, J. Griffiths, A. C. Bescoby, M. Wilson, R. W. E. Stickings, A. T. Cameron, R. L. Collett, J. S. Arthur, A. E. Woodhead, J. D. Davidson, A. R. Muirhead, R. K. Ellison, T. McL. Ormiston, F. J. E. China, L. Hawkes, W. V. Barritt, G. Bryce, R. T. Pearl, J. Waterston, J. Jackson, J. P. M. Dowdall, W. E. Evans, L. H. Callendar, R. S. Moon, A. G. Harrington, D. Williams, A. G. Yates, F. G. Caesar, S. C. Rigg, W. D. Dick, R. Wood, J. Buckland, W. H. S. Dunn, P. R. Fincher, T. W. Wheeler, W. G. Gibb, I. E. Macdonald, L. N. Duguid, F. C. Cook, F. Rae, J. Clayton, J. H. N. Price, K. MacLennan, A. E. Rayner, E. J. Messent, T. J. Murray, O. Cattlin, P. E. Lander, R. H. Murray, H. J. L. Barefoot, B. R. Hebblethwaite, M. S. Briggs, E. B. Argles, H. Vickers, T. Legge, A. E. Jury, J. A. Andrews, W. J. Read, H. L. Farmer, J. W. Hoflin, J. Pinder, K. S. Beken, A. D. Peacock, M. Canton, C. W. Yates, J. W. Munro, A. C. Swanston-Thomas, R. McKenzie, B. Chaikin, T. H. Savory, J. Dall, A. Sykes, W. Simpson (granted the rank of Lt.-Col.), L. A. Dingley (granted the rank of Maj.),A. C. Hepburn (granted the rank of Maj.), H. A. Higginson, O. Cook, A. Sutcliffe, C. R. Wallace, G. F. Rogers, H. Head, A. G. Atkinson, C. P. Matthews, W. S. H. Campbell, F. N. McRae, D. M. Neil, G. T. P. Tatham, L. Lloyd, G. M. Till, C. J. Regan, F. Evans, I. Walker, P. G. MacGregor, and S. Shaw; Lts. R. B. Driscoll, E. Jones, E. F. White, H. H. Clay, W. W. Earwaker, J. G. Seppelt, A. Hurd, B. Davies, and L. F. Wallis.

TERRITORIAL ARMY RESERVE.

The undermentioned relinquish their commns. and retain their rank, except where otherwise stated: Capts. E. B. Hinde (granted the rank of Maj.), J. A. Innes, D. W. Hardy, A. C. Hincks, C. W. Ellison, J. P. Elias, and J. M. O'Meara.

Maj. F. W. Burton-Fanning, having attained the age limit, is retired, and is granted the rank of Lt.-Col.

Maj. T. R. Bradshaw, having attained the age limit, is retired, and retains the rank of Maj.

Capt. W. Tyson, having attained the age limit, is retired, and is granted the rank of Maj.

Capts. J. Anderson, C. Cooke, and F. Phillips resign their commns. and retain their rank.

Sanitary Companies: The undermentioned, having attained the age limit, are retired, and retain their rank except where otherwise stated: Maj. C. E. Goddard; Capts. H. S. Fremlin (granted the rank of Maj.), C. G. Moor, L. W. Hignett, G. N. F. Reddan, W. F. Corfield (granted the rank of Maj.), N. Gibbie, R. A. Askins, D. H. Burleigh, and A. H. Hasnip.

The undermentioned, having attained the age limit, are retired, and retain their rank: Majs. H. N. Goode, D. P. M. Farquharson, J. Teare, and C. A. Spooner; Capt. (Bt. Maj.) H. Brian-Pearson; Capts. J. O. W. Barratt, J. Golding, and M. Priest.

ROYAL AIR FORCE.

Wing Commanders to be Group Captains: H. Cooper and M. W. Flack.

Squadron Leader to be Wing Commander: H. E. Whittingham.

Flight Lieutenants to be Squadron Leaders: J. M. A. Costello, J. H. Wood, and A. J. Brown.

INDIA AND THE INDIAN MEDICAL SERVICE.

Maj. Norman White has been charged with an important investigation in the East by the Health Organisation of the League of Nations. The services of Capt. C. J. L. Patch have been placed at the disposal of the Punjab Government temporarily. Majs. H. H. King and H. E. Shortt, Brevet-Maj. J. A. Sinton, Capt. G. C. Maitra, Dr. K. S. Mhaskar, and Capt. R. H. Malone have been appointed to the Medical Research Department, the last-named only temporarily. The Governor of the Punjab has appointed Lt.-Col. D. M. Davidson to be a member of the Punjab Legislative Council in the vacancy caused by the resignation of Col. R. C. Macwatt. Lt.-Col. W. M. Houston, health officer of the Port of Bombay, has been granted leave for a year. Lt.-Col. W. C. H. Forster has been appointed a member of the Punjab Legislative Council. Maj. E. H. M. Moore has been appointed Civil Medical Officer of Ranikhet; and Maj. W. L. Forsyth has been temporarily posted to the Punjab.

Correspondence.

"Audi alteram partem."

A CENTENNIAL YEAR.

To the Editor of THE LANCET.

DEAR SPRIGGE,—I am reminded that THE LANCET has entered upon its hundredth year and will doubtless celebrate its centenary in some form or another next October.

I can remember the Jubilee Dinner which took place at "The Ship," Greenwich, and I wonder if there are any survivors who were present at that dinner besides myself. Of those who were present, I seem to have retained the strongest impression of Dr. Steele and Mr. Potter, the lawyer. I remember Steele proposed the health of the lawyer, and that his address was full of classical allusions to Themis, &c., and that Mr. Potter made a happy reply.

It is 51 years since my first clinical communication was published in THE LANCET. I was unqualified, but was a Clinical Assistant at the Royal London Ophthalmic Hospital at the time, and the article was entitled A Visible Striation of the Normal Crystalline Lens, and was accompanied with drawings representing enlarged views of the stellate lines on the front of the lenses in one of the cases.

Wishing you a happy and prosperous New Year,
Believe me, yours sincerely,

Dec. 28th, 1922. JOHN TWEEDY.

*** This personal letter to the Editor is published by permission. Sir John Tweedy actually assisted the staff of THE LANCET before he was qualified, although he was not openly appointed until he had obtained a medical qualification. But later and for 13 years he remained in the closest connexion with the editorial department of the paper, and it was perfectly well known that, during the long illness of Dr. James Wakley, which culminated in his death in 1886, he was largely responsible for the conduct of this journal. Mr. Potter was a member of the firm of Pownall and Fairthorne, one of the partners in which was a connexion of the Wakley family. The firm came to the legal assistance of THE LANCET at the birth of the paper, and continued, under different styles, to act for THE LANCET for upwards of 80 years. Dr. James Peddie Steele, who died five years ago, at the advanced age of 81, had then been a member of the staff of THE LANCET for 50 years. He was a famous Latin scholar, and had made his mark as a classic before he graduated in medicine. In middle life he went to Rome, being connected with several Italian families, and in that city he was known to many British scholars and medical men and became a personal friend of the leaders of Italian scientific and social thought. From Rome, and later from Florence, he continued to write occasionally for THE LANCET until the end of his life.—ED. L.

THE PREVENTION OF DISEASE.

To the Editor of THE LANCET.

SIR,—Our national progress in the prevention of death has been much more than it might, if perhaps less than it ought to, have been. With infantile mortalities round about 80 and city and county death-rates of 11 or 12, the general appetite has been whetted for more. The medical schools have been urged to pay more attention to teaching the prevention of disease, and there is popular feeling going abroad that the real business of the doctor may after all be to keep people healthy rather than to cure them when they are sick. It seems almost churlish to examine so admirable a proposition too closely; general enthusiasm and a will to succeed will achieve much and more than they have already done, but it is probably as well to reflect briefly on what we mean by the "prevention of disease." Typhoid fever can be prevented

by keeping the typhoid bacillus away from man, rabies by similarly segregating mad dogs, small-pox by universal and repeated vaccinations, lead-poisoning by prohibition of lead. And the dramatic triumphs of this sort which have been reached show everyone plainly enough that they are to be repeated in other fields by a knowledge of causation. And with this appreciation of the importance of the discovery of causes there is apt to grow up an impression that the "prevention of disease" is fundamentally and primarily a search for causes, and that it can be promoted in no other way than by their identification and a practical application of the information obtained.

In a perfect world inhabited by none but perfect medical men this would no doubt be about all there is to say about an obvious truth. But it is suggested that this particular piece of truth is regarded as too absolute in those parts of the actual world which most nearly approach this sort of perfection, and that our teaching schools are apt to neglect another side of preventive medicine of no less importance. There is, in fact, a common confusion about the meaning of "disease." To the trained medical man who has no nonconformist ideals "disease" means a state where some part or parts of the body are altered in structure or function or both. There may be some difficulty in deciding whether alteration is present or not, but by this way of thinking a man with a granular kidney is certainly "diseased." To the patient, on the other hand, "disease" means simply feeling ill or inefficient as a whole or in parts, and from his own point of view the man with the granular kidney may not be diseased at all. In the medico-pathological sense everyone is more or less diseased by the time middle age is reached; atrophies, fibroses, and such like are certainly unpreventable in themselves and almost always incurable. With all respect to the prevalent cult of youth, middle-aged people are of some importance in the world, and one of the most useful aspects of the "prevention of disease" consists in helping their deteriorated bodies round the difficult corners and finding out how best they can adjust the small things of daily life in such a way that the "disease," objectively inferred by the doctor from his point of view, ceases to exist from the point of view of the patient.

This sort of prevention has nothing to do with ultimate causes and can be pursued with success in ignorance of them. It is the prevention which suggests the periodical medical examination of grown-up people and is justified by the results of such inquiries. Its systematic exploitation is, in comparison with the search for causes, sadly neglected. But in a working world the prevention of consequences and symptoms is one of the great charges on medicine, and the prevention of disease will make better progress if it is openly recognised that it has its symptomatic as well as its ætiological aspect.

I am, Sir, yours faithfully,

Jan. 1st, 1923. A PATHOLOGIST.

THE UNIVERSALITY OF APPENDICITIS AND CANCER.

To the Editor of THE LANCET.

SIR,—"The meat consumption of the world has been going up by leaps and bounds, and the number of cases of appendicitis and cancer has increased pari passu: hence the universality of the two diseases." In these words Dr. G. A. Casalis de Pury concludes his letter to THE LANCET (Dec. 30th, 1922) on the above subject. Commenting on his conclusion you, Sir, justly remark, "There seems here some confusion between correlation and causation." In point of fact, modern civilised man is much less carnivorous than pre-agricultural man. I have pointed out more than once that the chief difference between the diet of neo-civilised man and primitive pre-agricultural man lies in the much larger proportion of starch and sugar it contains. Existing pre-agriculturists consume animal and vegetable food in about equal proportions, and before the discovery of cookery, which placed a large supply of starch at man's disposal, he must have been still more carnivorous.

I am not aware of any evidence that extant pre-agricultural man suffers greatly from appendicitis or cancer. Among the Esquimaux, who subsist entirely, or almost entirely, on flesh, cancer is said to be unknown. It would seem, therefore, that there is nothing distinctly provocative of either cancer or appendicitis in a highly animalised diet per se, though one can indeed conceive that animal food which has been preserved—e.g., by curing, canning, or freezing—may at times act injuriously on the alimentary canal, and so predispose to either of these diseases.

While there appears to be some evidence that certain infectious diseases (rheumatism? influenza?) are occasionally responsible for appendicitis, I have little doubt that this disease is mainly dietetic in origin—though not, I think, attributable to an excess of *sound* animal food. Dr. Casalis de Pury, in proof of his contention, refers to the absence of appendicitis "among the Bulgarian peasants who feed exclusively on vegetables and sour milk, while it is frequent among town-dwellers whose diet approaches that of cities of Western Europe"; and he dwells upon the rarity of this disease in certain continental prisons, asylums, and convents in which the diet is largely vegetarian. But does the doctor not leave out of account the effect of simplicity and regularity of meals quite apart from the proportion of animal food they contain? I venture to think that in all institutions in which the inmates are kept on a simple, regular diet appendicitis will be found to be rare. An examination of our prisons, workhouses, schools, and other institutions with regard to the frequency in them of appendicitis and cancer would, I doubt not, yield some surprising results. It is now known that the shameful condition of our jaws and teeth is due to a faulty dietary; I have advanced what I believe to be incontrovertible evidence that adenoid disease owns a like origin; and I doubt not that appendicitis is in the main similarly induced. If these contentions are sound, it is up to us to prevent an immense amount of disease by the simplest of commonsense means.

One word as to the apparent increase of cancer and appendicitis within recent years. Dr. Newton Pitt tells us that cancer has more than doubled in frequency since 1880. How far is this statistical increase to be explained by increased accuracy in diagnosis and by an increase in the proportion of people living into the cancerous age? The same authority states that appendicitis was rare until 1889 or 1890, while more than 350 cases of this disease are now admitted every year into Guy's Hospital. How far, I would ask, is this assumed increase attributable to improved methods of diagnosis? Is it not a fact that appendicitis used frequently to be diagnosed as peritonitis, and that its alleged greater frequency dates from the time when abdominal surgery, owing to the general recognition of aseptic methods, came by its own?

I am, Sir, yours faithfully,

HARRY CAMPBELL.

Wimpole-street, W., Dec. 31st, 1922.

THE BACTERIOLOGY OF OBSCURE INFECTIONS.

To the Editor of THE LANCET.

SIR,—I have read with interest Dr. R. Fielding-Ould's article in THE LANCET of Dec. 23rd on Some Cases of Obscure Infection, and your annotation thereon. There does not appear to be anything very obscure about these cases. The clinical data supplied, although not complete, leave little room for doubt that they were septicæmias of enteric origin. Dr. Fielding-Ould devotes much time and space to demonstrating that they were not influenza. But there seems no good ground for ever suspecting that they were influenzal in nature.

"Unfortunately it was not possible to deal adequately with the bacteriological aspect of these

cases," says Dr. Fielding-Ould. Under these circumstances, it seems hardly fair to the bacteriologists to express the view, which you endorse, "that bacteriology in this connexion has lagged somewhat in the rear instead of taking, as it should, a rightful place in the forefront of the battle." There is no field of medicine which has been tilled with greater assiduity and success by bacteriologists—chiefly workers in the Royal Army Medical Corps. If Dr. Fielding-Ould will consult some of the pre-war numbers of the *Journal of the Royal Army Medical Corps*, he will find accounts of similar outbreaks of fever in India and elsewhere, which, for completeness and accuracy of detail, clinical, bacteriological, and serological, are models of scientific exposition.

In circumstances where hæmo-culture and bacteriological investigation of excreta and serological examination of blood cannot be undertaken useful information can be obtained by the application of Marris's atropine test. In a group of cases such as that described by Dr. Fielding-Ould, this test is capable of giving a definite answer "Yes" or "No" to the question "Are these infections of the enteric group of fevers?" It is, indeed, surprising that this simple clinical test is so little used since the war in the elucidation of obscure fever. It is not even mentioned in some of the most recent editions of standard English text-books of medicine. It takes time for the value of a discovery to be discovered.

I am, Sir, yours faithfully,

R. P. GARROW.

Health Office, Chesterfield, Dec. 26th, 1922.

JUSTIFIABLE FŒTICIDE.

To the Editor of THE LANCET.

SIR,—With reference to the letter on this subject in THE LANCET of Dec. 23rd, 1922, it can be taken for granted that no doctor will destroy a living fœtus unless he be driven to it in order to save the mother's life. Surely the authorities of the Roman Catholic Church take a short view of the matter. They apparently do not recognise that in allowing the mother to die by neglect of a craniotomy they are still not saving the child, for a dead mother means a dead unborn child. Thus there is the certainty of two deaths as against one.

While domiciliary conduct of labour continues to be in vogue, it will frequently be impossible to interfere in those extreme cases of pelvic contraction in any other way than by means of a craniotomy, unless a hospital or nursing home is available within reasonable time and distance. All this is a strong argument in favour not only of institutional treatment of labour cases, but also of antenatal care of pregnant women, whether the confinement is to take place in hospital or in the private house.

I think it may be confidently stated that adequate antenatal care of private cases is a comparatively rare thing.—I am, Sir, yours faithfully,

A. E. CHISHOLM,
Assistant Gynæcologist, Royal Infirmary, Dundee.

Dec. 28th, 1922.

THE INFECTIOUSNESS OF DIPHTHERIA: A QUESTION.

To the Editor of THE LANCET.

SIR,—A nursing association here has engaged the services of two private British nurses for a stated period of years. The nurses came out on the understanding that they should have a flat managed by themselves as their residence. The association has been unable to supply them with a private flat, and has instead given them rooms in lodgings where they live as guests.

It happens that one of the nurses has been in charge of a diphtheria case, and during the period of attendance she has several times gone to her lodgings whilst free from duty. The landlady has protested on the ground that the nurse may carry infection to the house, and the association is in favour of upholding the landlady's contention and of in future prohibiting the nurse from visiting her residence during the time she is in attendance on an infectious case. The nurse, on the other hand, argues that she has a perfect right to visit her residence, since she takes all reasonable and possible precautions against the carrying of infection, and further that she ought not to be deprived of making whatever use she likes of her leisure hours, such as the receiving of friends in her home, provided she has adopted all possible measures against the conveying of infection.

I have been asked to arbitrate between the contending parties. Can you let me know what is the rule in Britain in such circumstances, as I think that judgment in this case must be based on precedent, not on theoretical considerations?

I am, Sir, yours faithfully,

Madrid, Dec. 29th, 1922. IGNOTUS.

*** In case such a position should arise the original intention of providing a flat for the nurses was wise. The situation above described is practically unknown in this country, where nurses either have private lodgings or live in common with other nurses. Under the circumstances mentioned it would appear not unreasonable to ask that the nurse should not take infectious cases.—ED. L.

Obituary.

JOHN JAMES PRINGLE, M.B., C.M. EDIN., F.R.C.P. LOND.,

CONSULTING PHYSICIAN TO THE SKIN DEPARTMENT, MIDDLESEX HOSPITAL.

A WIDE circle of friends, both within and without the medical profession, will mourn the loss of Dr. Pringle, whose death at Christchurch, New Zealand, early last month, will come not altogether as a surprise.

John James Pringle was born at Lannhall, Dumfriesshire, in 1855, the third son of Andrew Pringle, of Lannhall and Borgue. Educated at Merchiston Castle School, Edinburgh, he graduated in medicine and surgery at the University of Edinburgh in 1876, continuing his studies in Dublin, Vienna, Berlin, and Paris, and taking the M.R.C.P. Lond. in 1884. Seven years later he was elected a Fellow. His first appointment was that of resident physician at the Edinburgh Royal Infirmary. After coming to London he joined the staff of the Middlesex Hospital as medical registrar 1883–84 and assistant physician 1885–95. In 1888 he was appointed physician to the skin department and lecturer on dermatology. He was also physician to the Royal Hospital for Diseases of the Chest 1884–91. During the war he became hon. consultant for skin diseases to the military hospitals in London. His help was constantly in request at meetings and congresses. He was secretary to the Dermatological Society of London for a number of years and acted as secretary-general to the Third International Congress of Dermatology held in London in 1896; at different times he presided over the Dermatological Section of the Royal Society of Medicine and of the British Medical Association. He was also a corresponding member of the Société Française de Dermatologie, of the Wiener and Berliner Dermatologische Gesellschaften, and of the Societá Italiana di Dermatologia. His contributions to dermatological literature were many and are to be found in Allbutt's System, Quain's and Fowler's dictionaries, and in special journals. He edited the well-known Portfolio of Dermochromes.

Pringle raised the dermatological department at the Middlesex to a high degree of efficiency. He was a first-rate teacher and had the faculty of creating interest in his subject among those he taught, who were attracted by the keen questioning to elicit a history,

the careful and close examination of the patient, and the clear and incisive discussion of the diagnosis. Although his actual diagnosis often seemed to be almost intuitive, it was based on most careful and scrupulous observation and could always be supported by close reasoning as well as by adroit marshalling of all the facts available. Pringle had a wide knowledge of dermatological literature, an excellent memory, and a quickly acting mind; it is therefore not surprising that his opinion on rare and obscure rashes was generally accurate. He retained to the end his interest in general medicine, and he was always ready to allow how much he owed to his experience as a general physician in the out-patient department, a post he only relinquished when the increasing claims of his special work rendered it impossible for him to do the double work. It therefore came about that he played an important part in emphasising the relationship of cutaneous manifestations to abnormal conditions of the systemic functions. Great as was his interest in diagnosis, he was always helpful in suggesting treatment and his large sympathy made him a friend to his patients as well as a physician.

A friend and colleague, on whose information we have freely drawn, writes: "Pringle was a many-sided man—intellectual, a good linguist, artistic in the true sense of the word, and a good musician with a fine singing voice. Perhaps, however, his most distinguishing characteristic was his kindly personality with a real genius for friendship. To generations of students he was familiarly known as 'Jimmy,' a fact he knew and was proud of in his heart. To anyone in trouble he was a kindly comforter and a generous friend. For years he paid a daily visit to cheer and interest a former senior colleague in his old age and infirmity. A Bohemian friend of his younger days, fallen on evil times and neglected by nearly all, found in Pringle's house asylum, nursing and comfort in his last illness. Such instances could be multiplied indefinitely, save that these kindly acts were done almost by stealth."

Of Dr. Pringle's services to dermatology another colleague writes: "Pringle was one of those who helped to bring dermatology into the position it now holds as an important branch of scientific and practical medicine. He was an active member of the Dermatological Society of London from soon after its foundation in 1882; he was editor of the *British Journal of Dermatology* in the period of its infancy; his zealous inspiration of those who took part in the London International Conference of 1896 led to one of the most successful congresses that have been held, and he was always justifiably proud of the volume of transactions which remain as a monument of his energy and enthusiasm. Although not an active worker in pathological research he was ever alive to all that was being accomplished or attempted in this field. Ichthyosis, Darier's disease, affections of the pigmentary system, and of the sweat glands and sebaceous glands, interested him, and his pioneer papers in this country on adenoma sebaceum, Pringle's seborrhœid and angiokeratoma will be remembered. Of his personal characteristics it may be said that he was accurate, precise, and punctilious in everything; in his work, in his speech and deportment, his household surroundings, his writings, and his management of a dermatological meeting. He was a skilled linguist, a lover of music, and an accomplished singer."

It was evident to all Dr. Pringle's friends that in recent years he had suffered greatly. It is not too much to say that during the war his work verged on the heroic. In spite of great pain and discomfort, often forcing him to take to his bed, he insisted on doing his full hospital work, and in addition he attended at the military hospital at Millbank. It was characteristic of him that he never allowed private work or personal discomfort or inconvenience to interfere with his hospital duties. It was hoped that the voyage to New Zealand and the change of scene might restore him to some degree of comfort and health, but the hope was futile.

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—At examinations held recently the following candidates passed in the subjects indicated:—

Surgery.—D. D. Anderson, St. Bart.'s Hosp.; G. K. Butterworth, St. Mary's Hosp.; E. M. Chidson, Royal Free Hosp.; H. Hirst, Manchester; G. Rothaus, Geneva and Charing Cross Hosp.; R. A. Walker, St. Thomas's Hosp.; and A. Weinger, King's Coll. Hosp.

Medicine.—D. D. Anderson, St. Bart.'s Hosp.; G. K. Butterworth, St. Mary's Hosp.; E. M. Chidson, Royal Free Hosp.; L. A. Daly (Sect. I.), St. Bart.'s Hosp.; S. Douglas, Univ. Coll. Hosp.; D. J. Dubash, Bombay and Royal Free Hosp.; M. P. Parker (Sec. II.), Royal Free and St. Mary's Hosp.; P. D. Richards, St. Bart.'s Hosp.; and S. W. Turtle (Sec. I.), London Hosp.

Forensic Medicine.—A. H. Allam, St. Mary's Hosp.; D. D. Anderson and L. A. Daly, St. Bart.'s Hosp.; and M. P. Parker, Royal Free and St. Mary's Hosps.

Midwifery.—D. D. Anderson and B. Dous, St. Bart.'s Hosp.; S. E. Hymans de Tiel, Royal Free Hosp.; and C. F. Parry, Guy's Hosp.

The Diploma of the Society was granted to the following candidates entitling them to practise medicine, surgery, and midwifery: D. D. Anderson, E. M. Chidson, B. Dous, D. J. Dubash, C. F. Parry, P. D. Richards, G. Rothaus, and A. Weinger.

UNIVERSITY OF ST. ANDREWS.—At recent examinations the following candidates passed in the subjects indicated:—

THIRD PROFESSIONAL EXAMINATION FOR M.B., CH.B. DEGREES.

Forensic Medicine.—Fakherddin El Ahmadi, Cecil B. Armit, Thomas F. Black, Robert Blair, William R. C. Campbell, Robert H. Craig, William Cunningham, John W. A. Dennis, Thomas A. Doran, Lewis Farrell, Douglas R. Ferens, Harold J. Fraser, Charles H. S. Gowdie, Jodh Singh Guruwara, James A. G. Keddie, Lutfur Rehman Khan, James M. A. Lowson, Alexander K. McCowan, John C. MacMillan, Douglas F. Menzies, John R. Murray, David Myles, George Napier, Donald M. Ross, Benjamin W. Rycroft, Jainti Dass Saggar, Alexander Shand, James D. Sinclair, Duncan Stewart, Charles F. Swinton, and John Wilson.

Public Health.—Fakherddin El Ahmadi, Cecil B. Armit, Thomas F. Black, Robert Blair, William R. C. Campbell, Thomas Christie, Robert H. Craig, William Cunningham, John W. A. Dennis, Thomas A. Doran, George A. Dunlop, Lewis Farrell, Douglas R. Ferens, Harold J. Fraser, Charles H. S. Gowdie, James M. A. Lowson, Alexander K. McCowan, John C. MacMillan, Douglas F. Menzies, David Myles, George Napier, John Petrie, Donald M. Ross, Benjamin W. Rycroft, Jainti Dass Saggar, Alexander Shand, James D. Sinclair, Ram Parshad Sood, Duncan Stewart, Charles F. Swinton, and John Wilson.

FOURTH PROFESSIONAL EXAMINATION FOR M.B., CH.B. DEGREES.

Medicine.—James Craigie, Jean M. Davidson, Harry Fisher, Penuel G. Grant, Sydney S. Ogilvie, John E. Overstead, Nora A. M. Rodger, Blanche D. S. Spence, William A. Steel, Arthur K. Tateson, William Thomson, and Thomas Wilson.

Surgery.—William S. D. Elder, Ruby N. Foggie, Penuel G. Grant, Charles R. Henderson, Mary M. Jack, Nora M. Lindberg, Gracie M. McRorie, Jean H. Morton, Janet L. A. Muirhead, Sydney S. Ogilvie, Alexander B. Richardson, Nora A. M. Rodger, Jamiat Singh, Janet O. Stephen, and William Thomson.

Midwifery.—David A. K. Cassells, Charles R. Henderson, Sydney S. Ogilvie, Blanche D. S. Spence, Janet O. Stephen, William Thomson, and Thomas Wilson.

UNIVERSITY OF DUBLIN, SCHOOL OF PHYSIC, TRINITY COLLEGE.—At examinations held recently the following candidates were successful:—

FINAL MEDICAL EXAMINATIONS.

Part II., Medicine.—Reginald Hegy, Robert H. Micks, James O'Neill McKenna, Louis J. Coetzee, Bernard Gluck, Cecil G. S. van Heyningen, Asher Asherson, Norman E. H. P. Williams, Douwe Marinus Vellema, Thomas G. Wilson, Arthur Darlington, Cecil W. R. McCaldin, Francis B. D'Arcy, John C. Earl, Ernest M. Landau, Cecil A. V. Ovendale, William E. Holmes, Florine Isabel Irwin, Jan Hendrik Hodgman, Philipp F. H. Wagner, Lazarus Heyman, Alexander Bernstein, Siegfried D. Gabbe, Reuben Lipschitz, Harold Renton, Robert L. C. Fisher, Charles Gordon, Percy Samolsky, Louis Harris, David S. Spence, Hugh R. Brady, Henry L. Hanna, James R. Wills, Rupert L. Hill, John Kalmanson, Maurice Schwartzberg, Joseph E. Deane, Frederick W. G. Smith, Jacobus F. van Staden, Aibert E. O'Donnell, Nicolass Jan Valkenburg van Druten, Alice E. Dockrell, Tobias Freedman, and Barend Vivier.

Surgery.—Bernard Gluck (passed on high marks), David J. Malan, James O'Neill McKenna, Isidore P. Myers, Louis J. Coetzee, Douwe Marinus Vellema, Michael G. J. Powell, Robert R. Baker, Ruth Lemon, Percy Samolsky, Charles E. Brunton, John B. Moran, Charlotte A. Stuart, Cecil G. S. van Heyningen, Max Wulfsohn, William E. Callanan, William E. Holmes, Harry C. Dundon, Paul J. Grobler, Robert A. O'Meara, Samuel M. Geffen, Mary H. Harcourt, Albert E. O'Donnell, Reginald R. J. Brandt, Victor Robinson, Maurice Schwartzberg, Michael Gallivan, John Kalmanson, John D. Wicht, and Albertus W. Eksteen.

Midwifery.—John M. Mounsey, Paul J. Grobler, Reginald R. J. Brandt, and Ely G. Copeland (passed on high marks), William R. Fearon, Benjamin W. D. Fayle, Francis J. O'Meara, Etienne Rodolphe Hafner, Henry W. L. Dale, Francis C. B. L. B. Crawford, Wilfrid E. C. Wynne, William S. Dixon, Reginald A. Dench, Arthur Darlington, Henry M. Martin, Albert V. Foster, Joseph A. Gayner, Harold Lewin, Agnes McLaughlin, Bernard Morris, Richard A. D. Pope, Harold Renton, George F. T. Saunders, Margaret L. Cowan, Anne D. Dockrell, Hans J. Hugo, Robert T. Jackson, Jack A. Levett, Cecil A. V. Ovendale, Samuel W. Jamison, Victor O. McCormick, William B. E. McCrea, Marjorie F. Sibthorpe, Charles T. MacCarthy, Hyman S. Roseman, Hugh R. Brady, Eileen A. Boyd, and William E. Hutchinson.

HARVEIAN SOCIETY.—The annual general meeting of the Harveian Society will be held at the rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square, on Thursday, Jan. 11th, at 8.15 P.M., when the election of officers for the forthcoming year will take place, and the President, Sir William Willcox, will give an address. A smoking concert will be held at the end of the meeting.

THE LATE DR. E. V. GOSTLING.—Ernest Victor Gostling, M.R.C.S. Eng., who died at Felixstowe on Dec. 30th, 1922, aged 50, qualified from St. Thomas's Hospital in 1900, having previously graduated in arts at Caius College, Cambridge, where he also distinguished himself as an athlete. After qualifying he became house surgeon at the Royal Infirmary, Derby, and later held the post of house physician at Addenbrooke's Hospital, Cambridge. As commander of the East Anglian Field Ambulance he was at the first landing at Suvla Bay, where he was wounded and gained the D.S.O. He afterwards became assistant director of medical service, retiring from the Territorial Service in 1919 with the rank of Lieut.-Colonel.

ROYAL SOCIETY OF ARTS.—Among the lectures to be delivered at the house of the Society, 1, John-street, Adelphi, London, W.C. 2, during January are the following: On Jan. 17th, at 3 P.M., Mr. C. A. Klein will speak on Hygienic Methods in Painting—the Damp Rubbing Down Process, Dr. T. M. Legge presiding. On Jan. 24th, at 8 P.M., Sir William Bragg, F.R.S., will deliver the "Trueman Wood" Lecture on the New Methods of Crystal Analysis, and their Bearing on Pure and Applied Science, Mr. Alan Swinton, F.R.S., presiding. On Jan. 31st, at 8 P.M., Mr. T. H. Fairbrother and Dr. A. Renshaw will discuss the Relation Between Chemical and Antiseptic Action in the Coal Tar Dyes.

THE LATE SIR FRANCIS FARMER.—The death occurred suddenly on Dec. 24th, 1922, of Sir Francis Farmer, L.D.S. R.C.S., who qualified in dental surgery in 1894 from the National Dental and Middlesex Hospitals, subsequently holding the post of house surgeon at the first named. He then became dental surgeon to St. Edward's School, Totteridge, and later to the London Hospital, holding the appointment of lecturer in dental surgery and pathology at the London Hospital Medical College. At the time of his death he was consulting dental surgeon to the London Hospital and to the Queen's Facial Hospital, Sidcup, where he had done excellent plastic surgery. In 1902 Sir Francis Farmer received a presentation from the Secretary of State for War in recognition of his services, and in 1916 he received the honour of knighthood. His numerous publications were mainly concerned with plastic surgery of the face and jaw.

INTERNATIONAL CONGRESS OF OPHTHALMOLOGY (1925).—At the International Congress of Ophthalmology held in Washington in April, 1922, Mr. Treacher Collins presented an invitation on behalf of all the ophthalmological societies of Great Britain and Ireland to hold the next congress in London in the year 1925. The invitation was accepted on the motion of Prof. Gullstrand, of Upsala, Sweden, seconded by Dr. Lucien Howe, of Buffalo, New York. A general committee consisting of representatives of the inviting societies has since met and has formed an executive committee, empowered to make arrangements for the 1925 congress. It is to be held in London during the four days, Tuesday, 21st, to Friday, July 24th. The three official languages are to be English, French, and German. The subscription for membership has been fixed at the sum of £2. Invitations will be sent to the principal ophthalmological societies or other representative bodies in every nation, asking them each to nominate a delegate to the congress who would be responsible for promoting its interests in the country which he represents, so as to endeavour to make it a great reunion of all those interested in ophthalmology throughout the world. In the preliminary notice of the Congress the Executive Committee is given as follows: Mr. E. Treacher Collins, chairman; Mr. J. Herbert Fisher, vice-chairman; Mr. Ernest Clarke, treasurer; Mr. Leslie Paton, 29, Harley-street, London, W., and Mr. R. R. James, 46, Wimpole-street, London, W., secretaries; Mr. A. B. Cridland, Mr. J. B. Lawford, Mr. Humphrey Neame, Sir John H. Parsons, F.R.S., Mr. A. H. H. Sinclair.

FRANCES WOOD MEMORIAL PRIZE.—The Council of the Royal Statistical Society will, in November, 1923, award this prize, value £30, for the best investigation of any problem dealing with the economic or social conditions of the wage-earning classes. Undergraduates or graduates of not more than three years standing of universities in the United Kingdom are eligible to compete. Essays are to be sent to the Hon. Secretaries of the Royal Statistical Society, 9, Adelphi-terrace, London, W.C. 2, not later than July 1st.

UNEMPLOYMENT RELIEF AND HOSPITAL REPAIRS.—A memorandum has been sent to the Government by King Edward's Hospital Fund for London suggesting that when public funds are being allocated to provide work for the unemployed, consideration should be given to schemes for hospital additions, alterations, and repairs. The Fund has been unable to make grants for this purpose in 1922 except in cases of great urgency, since maintenance grants take up so much of the money at its disposal.

THE GUILD OF SS. LUKE, COSMAS, AND DAMIAN. This guild, which was established in 1900, aims at facilitating intercourse between Catholic members of the medical profession and cognate branches, and the clergy throughout the British Empire, for the study and discussion of medico-religious questions. The President is Dr. Ernest E. Ware and the hon. secretary Dr. William J. O'Donovan, 30, New Cavendish-street, London. A new quarterly organ, entitled "The Catholic Medical Guardian," is being published by the guild; the first number will shortly be issued.

THE LATE DR. HERBERT ASHLEY GAITSKELL.—Dr. H. A. Gaitskell, who died at Westcliff-on-Sea on Jan. 1st, received his medical education at Cambridge University and Guy's Hospital, London. He graduated M.A. in 1898, M.B., B.C. in 1899, and M.D. in 1902. Among his past appointments were those of house surgeon at the Warneford Hospital, Leamington, and deputy medical officer of H.M. Prison, Northampton. He was ophthalmic surgeon to the Victoria Hospital, Southend, and to the Southend Corporation Children's Eye Clinic. Dr. Gaitskell was an occasional contributor to the columns of THE LANCET.

CENTRAL MIDWIVES BOARD.—A novel and interesting case came up at a recent penal session of the Board. The senior sister at a hospital approved for training midwives was cited to appear under the following circumstances. A patient who had previously lost two premature children was in the second stage of labour, the os fully dilated, the head in sight, the pains inefficient, and the fœtal heart sounds such as to suggest that the child's life was in danger. The sister telephoned for the salaried medical officer who was in the habit of attending whenever medical assistance was required. Unable to come just then, he instructed the sister to administer a little ether and to lift the head over the perineum with forceps; this was done with complete success, a living child being easily delivered. The patient's husband, however, lodged a complaint on the grounds that an anæsthetic had been administered and forceps applied without the presence of a qualified medical practitioner. Counsel for the Board stated that the matter was one which had not previously formed the subject of a decision or judgment by the Board. He submitted that the practice was improper in law, inasmuch as if some one other than a doctor used an anæsthetic or forceps and disaster resulted, legal immunity did not exist and indictment for damages or manslaughter might follow. According to the rules, an emergency arose when the doctor who was summoned was unable to come, and the midwife should have sent for another doctor. Counsel for the defendant submitted that in an emergency the sister had acted correctly in carrying out the doctor's instructions with, as it turned out, complete success. It was nowhere forbidden in the rules that a midwife should give an anæsthetic or use forceps, and no statute or regulation had been broken. After prolonged deliberation Sir Francis Champneys announced that as regards the midwife the Board was unwilling to use the word "misconduct" and the case was dismissed. On any subsequent occasion, he added, it would not be permissible, however, to allege exceptional circumstances. It was no part of a midwife's ordinary duty to do such things otherwise than in the presence of a medical practitioner. The chief responsibility rested upon the authorities of the hospital who ought to have tried to get some other medical man or woman. The Board felt for the midwife who was in a difficult position, inasmuch as the doctor had ordered her to do the work of a consultant. She had no right to feel that she was covered by the doctor; she must think of the welfare of the patient. The midwife's costs were refused on the ground that payment of costs by the Board would be tantamount to admission that the midwife's conduct was not in any way open to objection.

PASTEUR CENTENARY DINNER.—Dr. Pasteur Vallery Radot, Médécin des Hôpitaux de Paris, who is a grandson of Pasteur, will be entertained to dinner on Feb. 2nd at Vintner's Hall. H. E. le Comte de Saint Aulaire, the French Ambassador, will preside. Tickets may be obtained from Mr. André L. Simon, 24, Mark-lane, London, E.C. 3.

MEDICAL SOCIETY OF LONDON.—A pathological meeting will be held at 11, Chandos-street, Cavendish-square, W. 1, on Monday, Jan. 8th, at 8 P.M., when specimens of interest will be exhibited.

THE Prince of Wales has appointed Lord Dawson of Penn, Sir Thomas Horder, and Dr. John Weir to be Physicians in Ordinary to his Royal Highness: Lieut.-Col. Sir Hugh Rigby to be Surgeon in Ordinary; and Sir Stanley Hewett to be Surgeon-Apothecary to his Royal Highness and his Household.

BETHLEM ROYAL HOSPITAL.—A course of lectures and practical instruction for the Diploma in Psychological Medicine of the Universities of London, Cambridge, Durham, and others, will be given at the above hospital, commencing Jan. 15th. Syllabus and further particulars may be obtained from the Physician-Superintendent at the hospital, Lambeth-road, London, S.E. 1.

NEW MATERNITY HOSPITAL AT YORK.—A hospital containing 30 maternal beds, 40 cots, 6 beds for pregnant women, and 2 isolation wards, has recently been opened at York. The hospital has been adapted from a house known as Acomb Hall, and the adjoining farmhouse is being used as nurses' quarters. A scale of charges for patients who are able to pay has been laid down and it is hoped that the hospital will, to some extent, pay its way. The resident medical officer is Dr. Kathleen L. Cass and the temporary visiting surgeon is Dr. S. Louise Fraser.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Tuesday, Jan. 9th.

THERAPEUTICS AND PHARMACOLOGY: at 4.30 P.M.
Discussion on "The Present Position of Organotherapy," to be opened by Prof. Swale Vincent, followed by Dr. G. R. Murray, Dr. W. Langdon Brown, and Dr. W. R. Grove.

PSYCHIATRY: at 8.30 P.M.
Paper:
Dr. Leitch Wilson: The Endocrine Factor in Mental Disease.

Thursday, Jan. 11th.

NEUROLOGY: at 8 P.M.
Clinical Evening at the National Hospital for the Paralysed and Epileptic, Queen-square, W.C.
The Hon. Secretaries will be glad if Members will send them short reports of the cases they wish to show not later than Monday, Jan. 8th.

Friday, Jan. 12th.

CLINICAL: at 5.30 P.M. (Cases at 5 P.M.)
Cases will be shown.

OPHTHALMOLOGY: at 8.30 P.M. (Cases at 8 P.M.)
Case:
Mr. J. A. Valentine will show a case of Retinitis Pigmentosa sine Pigmento.
Papers:
Mr. Harrison Butler: Some Unusual Cataract Operations.
Mr. Charles Killick: The Treatment of Conical Cornea.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY, Jan. 8th.—11 A.M., Mr. Maingot: Surgical Ward Cases. 12 noon, Mr. Simmonds: Applied Anatomy. 2 P.M., Mr. Addison: Surgical Wards.
TUESDAY.—11 A.M., Dr. Paterson: Demonstration of Medical Cases. 12 noon, Dr. Burrell: Chest Cases. 2.30 P.M., Mr. Tyrrell Gray: Surgical Wards.
WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 12 noon, Dr. Burnford: Pathological Demonstration. 2.30 P.M., Mr. Donald Armour: Surgical Wards.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 12 noon, Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. Bishop Harman: Eye Department.
FRIDAY.—12 noon, Dr. Flett: Radiology. 2 P.M., Mr. Banks-Davis: Diseases of Throat, Nose and Ear. 3 P.M., Mr. Sinclair: Surgical Cases.
SATURDAY.—9 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 11 A.M., Mr. Maingot: Surgical Pathology.
Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M.: In-patients, Out-patients, Operations, Special Departments.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmorland-street, Marylebone, W.
(Post-graduate Intensive Course in Cardiology, Jan. 8th to 20th.)
MONDAY, Jan. 8th.—10 A.M., Dr. J. Strickland Goodall: X Ray Examination of the Heart. 11.15 A.M., Dr. Parsons-Smith: The Anatomy of the Heart. 2 P.M., Dr. R. O. Moon: Ward Demonstration. 3 P.M., Dr. J. Strickland Goodall: Out-patients.
TUESDAY.—10 A.M., Sir S. Russell-Wells: Sphygmomanometers and Arteriometers. 11.15 A.M., Dr. Hamill: The Physiology of the Circulation. 2 P.M., Dr. F. W. Price: Ward Demonstration. 3 P.M., Sir S. Russell-Wells: Out-patients.
WEDNESDAY.—10 A.M., Dr. John Parkinson: The Polygraph. 11.15 A.M., Dr. F. W. Price: Mitral Disease. 2 P.M., Dr. H. B. Weir: Pathological Demonstration. 3 P.M., Dr. R. O. Moon: Out-patients.
THURSDAY.—10 A.M., Dr. John Parkinson: The Polygraph. 11.15 A.M., Sir S. Russell-Wells: Diseases of the Pericardium. 2 P.M., Dr. J. Strickland Goodall: Ward Demonstration. 3 P.M., Dr. F. W. Price: Out-patients.
FRIDAY.—10 A.M., Dr. Parsons-Smith: The Electrocardiograph. 11.15 A.M., Dr. R. O. Moon: Prognosis in Heart Disease. 2 P.M., Dr. John Parkinson: Ward Demonstration. 3 P.M., Dr. John Parkinson: Out-patients.
SATURDAY.—10 A.M., Dr. P. Hamill: Ward Demonstration.

ST. JOHN'S HOSPITAL, 49, Leicester-square, W.C.
THURSDAY, Jan. 11th.—5 P.M., Dr. W. Griffith: Parasitic Diseases of the Skin.

Appointments.

ABEL, A. L., M.S. Lond., F.R.C.S. Eng., has been appointed Surgical Registrar at the Cancer Hospital (Free), Fulham, S.W.
ACHARYA, B. G. S., M.B., C.M., L.R.C.P., F.R.C.S., D.O., Prof. of Ophthalmology, Lucknow University.
FISHER, A. G. TIMBRELL, M.B., Ch.B. Bristol, F.R.C.S. Eng., Assistant to the Professional Surgical Unit, University College Hospital, London.
GROSS, M., M.B., B.S. Lond., Assistant Medical Officer of Health for West Suffolk.
MCEVEDY, P. G., M.B., B.S. Lond., F.R.C.S. Eng., Honorary Surgeon at Ancoats Hospital, Manchester.

Vacancies.

For further information refer to the advertisement columns.

Belgrave Hospital for Children, Clapham-road, S.W.—Hon. Radiologist. 50 guineas. Also Anæsthetist. 25 guineas.
Birmingham University, Faculty of Medicine.—Asst. Lecturer in Pathology. £300.
Bradford Children's Hospital.—Hon. Asst. P.
Cambridge, Addenbrooke's Hospital, John Bonnett Clinical Laboratory.—Clin. Path. £300.
Cancer Hospital (Free), Fulham-road, S.W.—Anæsthetist.
City of London Hospital for Diseases of the Chest, Victoria Park, E.—R.M.O. £250. H.P. £125.
Derby County Mental Hospital, Mickleover.—Jun. Asst. M.O. £350.
Derbyshire Sanatorium, Walton Lane, near Chesterfield.—Asst. M.O. £300.
Dreadnought Hospital, Greenwich.—H.P. £150. Also S. for Dis. of Throat, &c.
Essex County Council and Lexden and Winstree Rural District Council.—Asst. Co. M.O.H., &c. £700.
Hamilton, Hairmyres Sanatorium and Colony.—Clin Asst. £250.
Hospital for Consumption and Diseases of the Chest, Brompton.—Asst. P. Asst. Res. M.O. £150. Also H.P.
King Edward VII. Sanatorium, Midhurst, Sussex.—Second Asst. M.O. £250.
Liverpool, David Lewis Northern Hospital.—Two H.P.'s and Four H.S.'s. Each £100.
London County Mental Hospital Service.—Seventh A.M.O. £300.
Maidstone, West Kent General Hospital.—H.S. £220.
Manchester Royal Infirmary.—Asst. M.O. £100.
National Hospital for the Paralysed and Epileptic, Queen-square, W.C.—Sen. H.P. £150.
Royal Free Hospital, Gray's Inn-road, W.C.—H.P.
St. Helens County Borough.—Asst. M.O.H. £450.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. £80.
Sheffield Royal Hospital.—H.S. to Ear, Nose, and Throat Dept. and Asst. Cas. O. £150.
South Shields, Ingham Infirmary.—Senior and Junior H.S.'s. £200 and £150 respectively.
University of London.—Univ. Chair of Anatomy. £1000.
Western Ophthalmic Hospital, Marylebone-road, N.W.—Hon. Asst. S.
Whittingham County Mental Hospital, near Preston, Lancs.—Asst. M.O. Also Asst. M.O. Pathologist. Each £449 13*s.*
Winchester, Royal Hampshire County Hospital.—H.P. and H.S. Each £150.

The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointments:—Bruton (Somerset), Okehampton (Devon), Camberley (Surrey), Torrington (Devon).

The Home Secretary gives notice of a vacancy for a Medical Referee under the Workmen's Compensation Act, 1906, for the Ashbourne, Bakewell, Burton-upon-Trent, Derby and Long Eaton, Ilkeston and Belper, and Wirksworth and Matlock County Courts in Circuit No. 19. Applications for the post should reach the Private Secretary, Home Office, not later than Jan. 20th.

The Home Secretary gives notice that in consequence of the resignation of Mr. T. A. McCullagh, one of the Medical Referees under the Workmen's Compensation Act, 1906, for the Bishop Auckland County Court in Circuit No. 2, the appointment held by him is vacant. Applications for the post should be addressed to the Private Secretary, Home Office, and should reach him not later than Jan. 24th.

Births, Marriages, and Deaths.

BIRTHS.

BIGGER.—On Dec. 18th, 1922, the wife of W. G. Bigger, D.S.C., M.B., B.Ch., at Brackenhurst, Walton-on-Thames, of a daughter.

PAUL.—On Dec. 22nd, 1922, at Upper Northgate-street, Chester, the wife of Arthur Blackwell Paul, M.A., M.B., B.Ch.Cantab., of a daughter.

REID.—On Dec. 24th, 1922, at Courtfield-gardens, London, the wife of E. Lewis Reid, M.C., F.R.C.S., of a son.

SMALLWOOD.—On Dec. 22nd, 1922, at Wheathampstead, Herts, the wife of Dr. M. E. Smallwood, of a son.

SPARROW.—On Dec. 18th, 1922, at "Wayside," Watford, the wife of E. C. Sparrow, M.A., M.B., B.Ch., of a daughter.

MARRIAGES.

REID—JACKSON.—On Nov. 30th, 1922, at Ferozepore, Captain Spence Daer Reid, R.A.M.C., to Dorothy Hungerford Jackson, daughter of Mr. and Mrs. M. Hungerford Jackson, of Tudor House, Hanworth, Middlesex.

WARWICK—DALRYMPLE.—On Nov. 8th, 1922, at St. Thomas's Church, Amraoti, Berar, C.P., British India, Major Frank P. Warwick, D.S.O., I.M.S., to Una, eldest daughter of Engineer Captain John H. Dalrymple, R.N. (retired).

DEATHS.

HAYCRAFT.—On Dec. 30th, 1922, at Royston, Hertfordshire, John Berry Haycraft, M.D., D.Sc. Edin., F.R.S.E., Emeritus Professor of Physiology in the University of Wales, in his sixty-sixth year.

HOFFMAN.—On Dec. 26th, 1922, at Coombe Lodge, West-hill, Putney, Henry Westwood Hoffman, M.A., M.B.Cantab., aged 87.

NUNNELEY.—On Dec. 17th, 1922, at Bordighera, Frederick Pitcairn Nunneley, M.A., M.D. Oxon.

PICKERING.—On Dec. 19th, 1922, at George's-place, Bolton, Bernard Pickering, M.B., Ch.B., aged 41 years.

POOLE BERRY.—On Dec. 19th, 1922, at The Priory, Grantham, Harry Poole Berry, M.B., aged 63 years.

WAKLEY.—On Dec. 23rd, 1922, at Hôtel Splendide, Montreux, Switzerland, Clementina Agnes, widow of James G. Wakley, M.D.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

INDEX TO "THE LANCET," VOL. II., 1922.

THE Index and Title-page to Vol. II., 1922, which was completed with the issue of Dec. 30th, will shortly be published. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2.

THE LANCET: SUBSCRIPTION RATES.

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Notes, Comments, and Abstracts.

THE BREAKDOWNS OF MIDDLE LIFE.[1]

BY R. FORTESCUE FOX, M.D. LOND., M.R.C.P., F.R. MET.S.

AT the beginning of my professional life I spent 20 years at a Scottish health resort, and made some studies on the action of climates, waters and baths in chronic disease. Practising to a great extent among middle-aged patients, I often found myself asking: How and when will this or that individual break down? A large number of these people were not really ill. They came for change of air and scene, and sought advice in the use of waters and baths either because they were physically or mentally out of condition, or for some ailment that had thrust itself upon them in middle life. Sometimes the slighter forms of ill-health masked the beginning of a serious breakdown. We must all sometimes wonder how it is that so many apparently vigorous persons break down 30 years before their time, whilst delicate people often go on without serious trouble until old age. I should like in this address to describe certain forms of illness in middle life that attracted my attention, and to offer some observations upon their causation and treatment.

Scope of Inquiry.

I do not refer to syphilis, malignant disease, tuberculosis or degenerative arthritis, although these are fruitful sources of illness in the middle period of life, nor yet to kidney and heart affections in the ordinary sense. What we are at present concerned with is the familiar experience of premature failure spread over many functions and organs.

The signs of an impending illness of this kind are not difficult to read. There is some distress, physical or mental. The ordinary work and play are painful and not pleasurable. Slight efforts cause exhaustion, and this abnormal fatigability can easily be recognised and measured when ordinary symptoms are absent. I suggest that all these cases have much in common, and that upon analysis they all exhibit a lowering of the normal immunity of the body (sometimes sudden and inexplicable) to the invasion of micro-organisms, an altered metabolism, a defect of elimination and consequent accumulation of waste and toxic products in the blood and tissues, associated with disordered action of the heart and abnormal blood pressures and disturbances of the nerve centres; furthermore, that with these physical changes is associated more or less mental change. In most cases some one group of symptoms is usually predominant, which sometimes leads to a narrow and misleading view of the patient's real condition. I prefer the conception of a wide-spread disorder of function, leading to toxæmia and ultimately to structural changes. On this common basis we can recognise typical forms, perhaps alternating with or shading into one another.

I think that after the recognition of impending breakdown the next most important thing is a study of the family history. Premature and fatal breakdowns are naturally the mark of "short-lived" families, although it is quite true that alarming breakdowns are as often as not followed by complete recovery and a normal and even extreme old age. This is exemplified by the mental disturbances and neurasthenias of middle life, and by cases of disordered action of the heart of the same epoch, apart from valvular and vascular disease. The tendency to premature vascular degeneration and apoplexy is a more serious inheritance. Many family histories show a dangerous epoch, when vascular degeneration is apt to develop rapidly. In others (often in robust persons) it is easy to trace a singular want of healthy resistance to pneumonia, enteric fever, or infections from the bowel, throat, or skin, which account for many deaths in middle life. Apart from physical tendencies, we must not forget the subconscious effect of the premature death of parents upon their children at the same age.

The following are convenient, but often provisional, labels: (1) nervous and mental disorders; (2) cardio-vascular disorders with high blood pressure; (3) gouty catarrhs; (4) glycosuria; (5) lowered resistance to specific invasions.

1. *Nervous and Mental Disorders of Middle Life.*

The onset, although generally gradual, may be quite abrupt. A strong man, hitherto well, was suddenly seized with spasm of the platysma muscles whilst walking on the sands at Weston-super-Mare—the beginning of a serious breakdown. An editor, after 30 years' hard work, breaks down suddenly with labyrinthine vertigo at 55. Headaches, insomnia, depression, and irritability are often met with at

[1] Presidential Address to the Hunterian Society.

an early stage. The symptoms present great variability, and the illness may begin with neuralgia, or neuritis (tic douloureux, sciatica, lumbago, torticollis).

CASE 1.—Father and one brother died in middle life of some lung affection. Mother and another brother had gout. Patient married, six children, climacteric at 49. At 51 a severe nervous breakdown—headaches, "spinal irritation," distressing pains relieved by many visits (sometimes twice in the year) to Buxton. She "cannot perspire too much," and in the winter is relieved by portable Turkish baths, massage, and frequent doses of calomel. At 60, referred to Strathpeffer. Neuritis in both lower limbs, preventing walking and sleep. Hepatic dyspepsia. A course of sulphur waters with alternate sulphur and peat baths and packs inducing free perspiration. This with great relief in two following years.

CASE 2.—Family history of longevity. At 55 recommended to Strathpeffer. A politician and lawyer and in Parliament, hard work for 30 years, now wakes every morning between 5 and 6 with a sense of strain in the head, pains in back and across the shoulders. Repeated long holidays combined with courses of baths. Lived to 80 in full work.

CASE 3.—Father died at 50. A business man, a careful liver with many years of hard and anxious work. Had sunstrokes in early life, 20 years in America, dyspepsia from hot food and ices. From 42 onwards occasional rheumatism and cramps. Lost six members of his family. At 50 a sudden nervous breakdown—acute pain in cervical and lumbar spine and limbs, attack of syncope lasting nearly two days, neuralgic pains "every few minutes." "Jenner said he could do nothing." Failure of digestion, 2 st. lost in weight, for three months confined to bed, passing much uric acid. Recommended by the late Sir William Gowers to Scotland for a long rest to the nerve centres. On arrival pain in upper limbs and shoulders on slight movements, head hot, vaso-motor disorder, urine and heart normal. Mild course of sulphur waters and sedative baths. Ascended Ben Wyvis before returning home.

CASE 4.—Headmaster of a large school, with responsible public and agricultural work in addition. Both parents died at 64. At 50 an attack of nervous depression and intense fatigue, unable to speak to his friends, pulse intermittent. At 54 a second breakdown, recommended to a health resort. Pain in right hypochondrium, liver contracted. Absolute rest, sedative baths, a full course of sulphur waters. At 57 reported to be quite free from symptoms.

Such cases occur to every practitioner. Those that I have quoted agree in having a somewhat sudden onset, a rather serious type of nervous disturbance, and generally prolonged and continuous mental strain. They also showed digestive, eliminative, and circulatory disorder, and a tendency to recurrence, making it necessary to avoid undue strain and to have recourse from time to time to sedative and eliminative treatment.

2. *Cardio-Vascular Changes and High Blood Pressure.*

In a medical report on the risks of middle life, presented to the Australasian Parliament in 1916, it is stated as a general belief that at about 40 years of age slow degenerative changes commonly begin in the large arteries, with an elevation of arterial blood pressure which may amount to about 30 per cent.; that the causes of such degeneration are threefold: (1) overstrain or fatigue, reflected in the nerve centres; (2) alimentary or catabolic toxæmia, usually from excess of food; (3) infection from the bowel or throat; adding that the kidneys may become the dominant cause of the toxæmia when the renal vessels are seriously affected. The report further points out the serious injury from nerve strain at from 40 to 50 years of age, the heavily increasing incidence of apoplexy after 40, and finally recommends that "provision be made to encourage the early diagnosis and treatment of high arterial tension," and incidentally, from this point of view, the oversight of the health of industrial workers. My own experience suggests that high arterial tension is mainly due to (1) overstrain connected with the conditions of modern life, and (2) inherited tendency.

CASE 5.—A King's counsel, with continuous brain work and of sedentary life. At 45 rheumatic gout in feet and knees, but "kept it under at Harrogate"; acid dyspepsia and (nota bene) bleeding piles. At 60 referred to the Scottish spa for eczema by the late Dr. James Little, of Dublin. Did well. At 64 a "stroke," but continued in full work for two years longer. Kept up his shooting and fishing in Sutherland until he was 73. Died at 75 of gradual failure. In this case the repeated courses of purgative water and the relief of excessive arterial tension by hæmorrhages from the bowels probably lengthened life by many years.

CASE 6.—Family history of death in middle life from paralysis, heart and kidney disease. Rather a free liver; gouty; eczema. At 55 Prof. Grainger Stewart observed albuminuria. From 57 to 61 frequent epistaxis (again nota bene). At 61 referred to Strathpeffer. A pale, stout man; urine generally with a trace of albumin. At 68 severe angina pectoris. At 69 died of bronchitis and heart failure. Here also I suggest that we may attribute to the loss of blood by epistaxis and to the spa treatment that this patient lived much longer than was usual in his family.

CASE 7.—An energetic Scotswoman, much abroad in responsible positions. At 45 her troubles began with "rheumatism" in the knees; at 48 the climacteric; recommended to Scotland; complains of blood to the head and vertigo, and asks to be bled. At 54 a second visit, circulation very uncomfortable, "sinking feelings at night." Second sound of heart very hard. At 58, systolic blood pressure 156, chilly extremities. I was anxious to ascertain the condition of the small vessels, and the late Mr. Marcus Gunn kindly reported "retinal arteries small and evidently sclerosed, veins a little compressed by them." This was a case of typical hyperpiesis as described by Sir Clifford Allbutt, with increasing arterial hypertonus or spasm. It was systematically treated by venesection, beginning at 58 with two venesections at a month's interval, followed by a course of tepid effervescent baths. At 59 a fourth course of waters, and a large natural hæmorrhage from rectum. At 60 much vertigo, heart's apex well outside nipple, right hemiparesis, confusion of speech for 24 hours. At 62 some vertigo; venesection 20 oz. Return of symptoms in three months, another venesection to 24 oz. Further venesections at 63 and 66. At 68 reported very well, leading a quiet life, 20 years after her first symptom of arterial hypertension. The relief experienced after blood-letting was immediate.

Many times in other cases I have seen apoplexy averted by a timely venesection. When the hypertension is causing much discomfort, a venesection may well be given before commencing a course of waters.

3. *Gout.*

It seems that in some gouty families the disturbances of middle life fall more upon the mucous membranes than upon the vascular system. The men, and women too, complain of "liver," heartburn, abdominal disturbance, headaches, giddiness, vague pains, many catarrhal symptoms, and circulatory disturbance. The pulse is generally weak and slow, but the tension is seldom high. After some years health is usually much better, and these people go on to a long age.

CASE 8.—A medical man with inheritance of gout on both sides. Many febrile "rheumatic" attacks in early life, with heartburn, flatus, and diarrhœa. After 22, very liable to aphonia and cough, and recurring lumbago. At 40, a severe digestive illness. At 43, referred to Strathpeffer for "rheumatism"; much too stout, heart normal, but action weak, urine normal, skin active. He was feeble and depressed, very liable to chill and sleeping badly. A full course of sulphur waters with douches and peat baths. Very well for two years. At 45, a second course of treatment for lumbago and malaise. Digestion fairly good. Heart, a suspicion of mitral systolic murmur: again much better. Six years later, aged 51, after prolonged hard work, a third course with similar good results.

4. *Glycosuria.*

The two following cases illustrate different types of glycosuria met with in the middle period of life:—

CASE 9.—A Scottish "merchant" or shopkeeper, sedentary; too much brandy; severe quinsy and enteric fever as a young man. At 53, severe pains in legs after repeated influenza, much lassitude, increasing pain, discovery of sugar in the urine. At 54, referred to Strathpeffer. Urine 40 oz., specific gravity 1035; sugar 9·4 gr. per oz. (one specimen 25 gr. per oz.); pulse 96, perspiring, tongue milky white. Sulphur waters, douches, and diet. Sugar rapidly reduced and absent after two weeks. The following year a second visit, reported much better. Had been very well all winter, but in the spring return of influenza with weakness and pains. Urine 42 oz., sugar 4·7 gr. per oz.; 40 oz. sulphur waters daily, with opium pills; increased diet. Volume of urine increased to 68 oz., sugar 1·9 gr. per oz., and large crystals of uric acid. At 56, a third course of waters. Has carried on very well, but knocks up in spring. Some pains in left arm and over heart, no murmur. Pulse 100. Liver enlarged. Urine not excessive, sugar 3½ gr. per oz.; again left the spa much better. Subsequently resumed and increased his brandy; attacks of tachycardia. Died at 59 of diabetic coma, after septic gum-boil.

CASE 10.—Family history, several short-lived members. An advocate. At 33, rheumatic fever; at 35, nervous breakdown from hard work and overstrain. Better after a sea-voyage. At 55, much run down. Sciatica, relieved at Wiesbaden. At 56, nervous depression, worried. Heart, very feeble action, often "fluttering" sensation behind sternum, no dilatation. Pulse 66, very soft. Systolic blood pressure 120–130; feels the cold, "expands in warm weather," drinks wine; occasional eczema and cramp of anal sphincter. Urine contains 0·5 per cent. of sugar. Diagnosis, "gouty, wear and tear, nervous and mental depression." Under dieting and cardiac tonics improved, the sugar continuing and the blood pressure remaining low. Took a course of waters and effervescing baths at Royat, and later, for poor circulation, sitz-baths at 115° F. for ten minutes every second night. At 57, after a year of unbroken work in the courts, referred to Vichy for water and baths. The blood pressure improved at Vichy to 140 systolic with increased vigour, sugar still present. The following year drank Mattoni or Evian water at home, with benefit. At 60, after a fatiguing session, systolic blood pressure registered only 100; referred to Harrogate and took a course of effervescing baths. This was repeated for several years, always improving his health and spirits, and invigorating the heart. An ammonia bath every night before dinner was also useful. During these years carried through much additional work—with periods of exhaustion, sense of impending disaster, sinking feelings or vertigo, apparently due to feebleness of the heart muscle. At 66, seemed well, but six months later jaundice supervened. Upon operation, the head of the pancreas was found to be enlarged and extremely hard, and the related lymphatic glands swollen; survived for six weeks. The glycosuria, which had been generally present for at least 11 years, disappeared when the jaundice set in.

5. *Lowered Resistance.*

There are some other illnesses of middle life, very various in form, which all seem to depend upon a rather sudden lowering of normal resistance. Most practitioners have seen

the nervous and mental disturbance which in certain subjects follows surgical operations and shock. The common occurrence of Graves's disease and septic arthritis in women about the climacteric may be cited. A breakdown of resistance and a rapid invasion not uncommonly follows a prolonged local septic infection. An analogous breakdown sometimes unfortunately occurs in those who have been too much exposed to X rays. A simple case may serve to illustrate this series.

CASE 11.—Father died of renal disease at 66 and mother of paralysis at 60; father's sister died of goitre. A strong and active man; 11 years' hard work in the tropics, exchanged for an equally arduous life in England at 44. At 50, inflamed throat, fever, blood poisoning, hæmaturia, blotchy erythema. "Pure cultures of streptococci in throat and urine." After partial recovery from the acute condition, took a long rest abroad, but returned still feverish at night and wasting. Recommended by Dr. William Gordon, of Exeter, and Sir T. Barlow to the Scottish spa. Symmetrical enlargement of thyroid gland; rapid heart (120 recumbent), but no murmur. Nervous and muscular asthenia, skin moist, flushed, and remarkably hot. After a short course of cool effervescent baths, without much apparent benefit, spent a month on the northern coast followed by six weeks in an open tent on a high moor. Steady recovery; returned to "three-quarter work" in eight months, and went on with no further breakdown for 15 years. At 63, occasional slight febrile attacks. At 66, several acute attacks, with rigor and high fever, purging, and rapid wasting. Hands white and cold, nails blue; heart dilated, pulse 90, B.P. 48–125. Urine normal. Died of heart failure after a month's illness.

Features in Common.

A little reflection suggests that whatever their clinical form or the label that we attach to them, all these cases have two outstanding features in common: (1) A serious *nervous disturbance*, with its outward and visible signs of chronic fatigue, exhaustion, or shock. (2) Combined with this nervous disturbance, and probably related to it, a state of toxæmia from *lowered resistance* to autogenous or exogenous invasion. The nervous disturbance evidently affects the autonomic and sympathetic systems, and may take one of two forms—either vascular spasm (hypertonus), as in most cases of gout, hyperpiesis, angina pectoris and apoplexy, or else the contrary condition of vascular relaxation, as in Graves's disease, tachycardia, glycosuria, &c. There appears to me to be at first no clear dividing line between these different forms of incipient disease. They are rather different aspects of the same thing. The failure of health in middle life is often at first vague and indeterminate, not localised in particular organs, and therefore unfortunately easily overlooked. Later, its apparent localisation in one system or organ is apt to mask a widespread breakdown. Our use of labels ought not to obscure the fact that both mind and body have a share in this condition, and that on the physical side the nervous, vascular, glandular, digestive and eliminative functions are more or less disturbed. When the disease is definitely localised, treatment may prove no longer effectual.

Let me add that although they occur in middle age, when people begin to talk about Anno Domini, and when, as the Australian Committee remind us, some vascular changes are generally recognised, they do not appear to me to bear any of the characters of normal involution or senescence. They are, on the contrary, violent breaks in the continuity or equilibrium of health—storms which under favourable circumstances are often followed by many years of good weather. I must leave to others who are more competent the task of tracing the links of causation underlying such conditions. The present analysis is very tentative and incomplete. But we may ask, does it, so far as it goes, throw any light on the treatment of these disorders?

Some Conclusions.

(1) That periodical *cessation of work* and *change of scene* are not only the best preventives of breakdown, but also curative in slight cases. This will be readily admitted. One of the most gifted and public-spirited men in a great city, still leading a laborious life at 63, told me that since his severe illness at 44 he had "struggled on, by means of many holidays." Corruption, we are told, comes when even the best of customs becomes too customary. I would plead for a more scientific study of holidays. Many are worse than useless. Moreover, there is a point at which a man ceases to react pleasurably to new conditions, and when definite treatment is required.

(2) That at all stages treatment ought to be chiefly directed to (*a*) allaying the nervous disturbance, (*b*) removing the toxæmia.

(3) That the medical value of *climatic stations*, both in allaying nervous disturbance and in stimulating the healthy resistance of the tissues, is insufficiently recognised. In early breakdowns a prolonged "change of air" under judicious medical care often brings about a complete and permanent recovery. There are in Great Britain about 150 places which claim to be health resorts, and perhaps we forget both the variety and the efficacy of climatic treatment which lies at our doors.

(4) That *a properly appointed spa* unites the benefits of a holiday and of an appropriate climate, with the special effects of external treatments by baths and other applications, and also of internal treatment by some kind of medicinal waters, together with a powerful mental suggestion of health. What is called "spa treatment" is therefore obviously a complex prescription, and in serious cases needs much knowledge and discrimination.

(5) That *almost all cases of breakdown are curable* at an early stage, and that the experience of many good observers at spas and climatic stations shows encouraging results of treatment, even in what appear to be serious and even hopeless cases. It may be added that one of the most useful functions of the health resort is to prolong the active life of the brain worker.

(6) May I here interpolate from my own experience some suggestions for those who are engaged in treating the disorders of middle life by means of waters and baths?

(*a*) Increased elimination, as already stated, comes first. Saline waters are rightly esteemed, but of equal or even greater importance for the relief of chronic toxæmias are, in my opinion, the *diuretic waters* which produce a greater output from the kidneys than the intake of water. When combined with sedative or derivative baths, such waters are certainly beneficial in many cases of arterial hypertension. It is interesting from this point of view to remember that some endocrine secretions are believed to be powerfully diuretic.

(*b*) The *sedative treatment* of nervous disturbance comes next, and ought to be axiomatic in dealing with the results of overstrain. Apart from sedative climates, a long range of external applications is available. Winternitz was justified in his belief that by means of baths, still or effervescent, and graduated in point of time and temperature, it is possible to bring to bear in neuro-vascular disturbance almost any desired degree of sedative action.

(*c*) *Stimulating forms of external treatment* (cold salt frictions, contrast douches, &c.) increase the resistance of the tissues and fortify the body against microbial infections.

(*d*) *Blood formation can be stimulated* by the same means, especially in pure air and at a certain elevation. Moreover, if certain waters are at the same time taken internally, still better results in the restoration of the blood are obtained. Spa treatment of this type has therefore been recommended, I think justly, for anæmia, and is worthy of trial also for the changes induced by exposure to X rays.

(*e*) The remedies of the health resort are, of course, not admissible in the acute phases of disease. But let us not forget in these days of specialism the unity of medical practice. He who studies and practises the methods of the health resort is perhaps after all a specialist of another kind, for he devotes himself to the investigation of incipient and chronic maladies and to the application of physical remedies (in the words of Hippocrates, "airs and waters and places") to their relief.

(7) Lastly, though first in importance, I would submit that the systematic periodical *measurement of the health of middle-aged persons*, especially those engaged in mental labours and responsibilities, is greatly needed, especially now after the long strain of the war, and would be the means of averting many critical illnesses and prolonging many lives.

A Note on Measurements.—(1) The rapid development of vascular hypertension and hyperpiesis and the frequent occurrence of cerebral hæmorrhage in comparatively young men are, I believe, generally preventable. For this purpose careful records of pressure readings might well be kept during the danger period, especially in families showing a tendency to such accidents. (2) Is it possible in the same way to measure immunity or resistance? It is a familiar experience that in health the application of cold to the skin after an initial contraction of the vessels brings an increase of blood to the part, with vascular dilatation and a pleasant glow. I suggest that sluggishness or absence of this normal neuro-vascular reaction to cold is one clear sign of lowered resistance in the tissues. (3) The measurement of nervous sensibility and reflexes affords some criterion of nervous stability. Auditory hyperæsthesia is often a sign of overstrain, and any local ailment long in abeyance may be suddenly exaggerated. (4) On the mental side, the measurement of attention, concentration, memory, &c., may reveal the beginnings of serious disturbances.

All must agree that under an ideal dispensation of preventive and curative medicine these breakdowns in the mid-career of life would not take place. Ought they to be so common now? We cannot measure the tragic losses that they entail—the support of families, the slowly ripened fruit of experience, the gathered knowledge, applied in the very prime of life to the advancement of science and in the public service. I would ask you, cannot we do more to detect the danger and avert the blow?